JOURNAL
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AMERICAN VETERINARY MEDICAL ASSOCIATION

In This Issue

GENERAL ARTICLES

The Eighth Army Veterinarian Helps to Raise Japanese Public Health Standards—*Mary Glenn B. Hamilton* 1
What We Know About Brucellosis 6

SURGERY AND OBSTETRICS

A New Method of Intramedullary Pin Fixation—*Salo Jonas* 9
Scrotal Neoplasms—A Report of Two Cases in the Dog—*Charlie N. Barron* ..13

CLINICAL DATA

Swine Anesthesia via the Vena Cava—*J. W. Bailey* 15
The Treatment of Heartworm-Infected Dogs with Arsenamide, a Phenyl Arsenoxide—*Ronald F. Jackson* 17
DDT Poisoning in a Cow—*L. M. Koger* 22
Liver Flukes from a Cat—*R. D. Turk* 23
Leiomyosarcoma in a Dog—*Morton L. Sall* 23
Immunity Status of Normal, Vaccinated, and Rabid Animals—*Don L. Mace and Francisco S. Cortez* 24
Rabies in Illinois—*L. R. Davenport* 31
Diabetes Mellitus in a Dog—*S. Pollock and E. O. Bauman* 34
Erysipelothrix Rhusiopathiae Infection in Fowl—*C. B. Hudson* 36
Symposium on the Use of Sulfonamides for Control of Poultry Diseases—*J. P. Delaplane, E. M. Dickinson, and C. A. Brandly* 40
Anaplasmosis Treatment with Acaprin—*Fred B. Pulling* 46
A Review of Histoplasmosis—*Joseph S. Ruhe and Philip D. Cazier* 47
A Lethal Disease of Newborn Calves—*Floyd W. Young* 53

NUTRITION

Nutritional Deficiencies in Mink with Special Reference to Hemorrhagic Gastroenteritis, "Yellow Fat," and Anemia—*C. K. Whitehair, A. E. Schaefer, and C. A. Elvehjem* 54

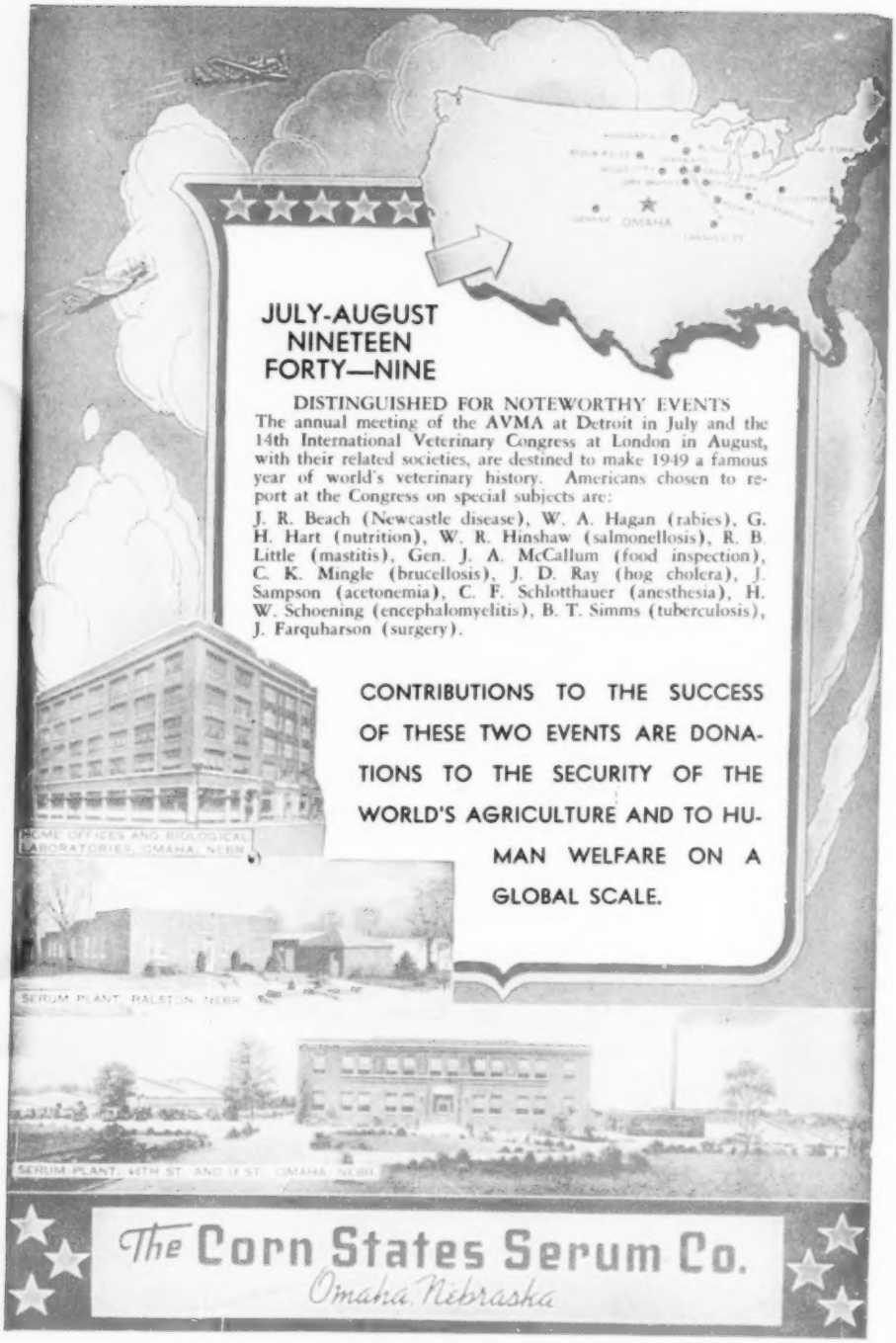
EDITORIAL

Layman Employment a Maladjustment 60

Surgery and Obstetrics 9
Clinical Data 16
Nutrition 54
Editorial 60
Current Literature 62
The News 66
Coming Meetings 26

(*Contents continued on ad pages 2 and 4*)

Volume CXV JULY 1949 Number 868



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NINETEEN
FORTY—NINE

DISTINGUISHED FOR NOTEWORTHY EVENTS

The annual meeting of the AVMA at Detroit in July and the 14th International Veterinary Congress at London in August, with their related societies, are destined to make 1949 a famous year of world's veterinary history. Americans chosen to report at the Congress on special subjects are:

J. R. Beach (Newcastle disease), W. A. Hagan (rabies), G. H. Hart (nutrition), W. R. Hinshaw (salmonellosis), R. B. Little (mastitis), Gen. J. A. McCallum (food inspection), C. K. Mingle (brucellosis), J. D. Ray (hog cholera), J. Sampson (acetonemia), C. F. Schlotthauer (anesthesia), H. W. Schoening (encephalomyelitis), B. T. Simms (tuberculosis), J. Farquharson (surgery).

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CONTENTS

(*Continued from Cover*)

SURGERY AND OBSTETRICS

Transplanting the Ureters in the Dog 12
Causes of Infertility 12
Infertility and Sunshine 15
Traumatic Pericarditis 15
Unsoundness and Heredity 15

CLINICAL DATA

Clinical Notes 16
Hydrocyanic Acid Linked to Bloat 30
Brucellosis Eradication 30
Blood and Sulfadiazine in Brucellosis 32
Rabies Control 32
Avian Pneumoencephalitis Vaccination 33
The Common Oil Can 33
Disease Control 35
Isotopes 35
Objectives of Veterinary Medicine 35
Notes on Brucellosis 39
Veterinary Vital Statistics 39
Gleanings from Committee Reports 50
Equine Encephalomyelitis in Louisiana 52
Excerpts from a Presidential Address 52

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CONTENTS—Continued

Nutrition

Trace Minerals in the Ration 58
Stiff Lamb Disease 58
Fat Digestion 59
Soybean Phosphorus Completely Nutritive 59
Vitamin and Mineral Needs of Swine 59
Intestinal Vitamin Synthesis 59
Ubiquitous Phosphorus Deficiency 59

Editorial

Postgraduate Programs 60
Human and Veterinary Medicine 60
The Challenge of Practice 61
Should Veterinarians Memorize this Program? 61
A Directive on Professional Behavior 61

Current Literature

Abstracts

ANTU Poisoning in Dogs, 62; Avian Electrocardiogram (ECG), 62; Relation of Age to Mastitis, 62; Equine Encephalomyelitis Virus in the Blood, 62; Japanese B Encephalitis, 62; Inhibiting Penicillin Excretion in Horses, 62; Sludged Blood in Animals, 63; Intestinal Worms in Calves, 63; A Ruminometer, 63; Studies on the Sarcomata of the Skin of Dogs, 63; Pregnancy in Mares, 64; Contagious Pyoderma in Swine, 64.

Books and Reports

Radioactivity, 64; Constant Companion of the Veterinarian, 64; Fundamental Considerations in Anesthesia, 65; Veterinary Helminthology, 65; How to Become a Doctor, 65.

The News

The 14th International Veterinary Congress 66
AVMA Membership Passes 10,000 Mark 66
AAHA Contest Winners 66
AVMA Convention on National Farm and Home Hour 66
Twenty-six Constituent Associations Use AVMA Radio Scripts 67
AVMA Research Fellows 68
Student Chapter Activities 68
Applications 70
Among the States and Provinces 74
Foreign News 79
State Board Examinations 80
Veterinary Military Service 80
Deaths 80

Miscellaneous

Are You Cheating Yourself?, 5; Foot-and-Mouth Disease Breaks Out in Vaccinated Mexican Cattle, 8.

An' Related Topics 24

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AVMA ☆ Report

Veterinary Medical Activities

✦ President L. M. Hurt represented the Association at the Annual Conference for veterinarians, State College of Washington, Pullman, June 15 to 17; at Idaho VMA, Boise, June 20 and 21; at Montana VMA, Bozeman, June 22 and 23; at Utah VMA, Provo, June 24 and 25; and at Northwest VMA (Oregon, Washington, and British Columbia), Victoria, B. C., June 28 to 30.

★ ★ ★

✦ The American Feed Manufacturers Association has sent a copy of the editorial "Will Drugged Feeds Replace Good Management?" (June JOURNAL, p. 441) to each of its members.

★ ★ ★

✦ Program plans for Detroit are "in the bag." Public Relations Counsel L. R. Fairall has worked with the Local Committee on Arrangements to establish contacts with all newspapers, radio stations, and television studios in the Detroit area to insure full and accurate coverage of the convention activities.

★ ★ ★

✦ National Farm and Home Hour will devote half of its program on Saturday July 16 (National Broadcasting Co., 12:00 to 12:30 p.m., Central Daylight Saving Time) to a discussion of brucellosis. President-Elect C. P. Zepp, Sr., and Drs. I. Forest Huddleson and L. M. Hutchings will participate. Tentative plans call for other members, as yet unselected, to enter the discussion also.

★ ★ ★

✦ Executive Board Chairman W. R. Krill was the guest speaker at the Honor Day Exercises of the New York State Veterinary College, May 13, 1949, when 27 students received prizes and recognition for outstanding work. The title of Dr. Krill's inspiring talk was "The Challenge to Our Profession."

★ ★ ★

✦ President-Elect C. P. Zepp, Sr., attended the Annual Conference for Veterinarians, Kansas State College, Manhattan, June 9 and 10; the Georgia State VMA meeting, Atlanta, June 13 and 14; the South Carolina Association of Veterinarians, Columbia, June 15 and 16; and the Maryland State VMA, Ocean City, June 16 and 17.

★ ★ ★

✦ The General Session of the AVMA convention, on Tuesday evening, July 12, promises to be one which will be long remembered, not only as a highlight of this convention but of AVMA conventions in general. It is hoped that every veterinarian registered for the meeting will attend and that his wife will attend with him.

★ ★ ★

✦ Executive Secretary J. G. Hardenbergh spoke before a meeting of the Missouri VMA, St. Louis, June 6 and 7, and also inspected the convention facilities of St. Louis in connection with the invitation to meet there in 1951.

★ ★ ★

✦ The AVMA has been invited to become the coördinating and supervising agency for an International Institute of Physiology and Pathology of Animal Reproduction and Artificial Insemination. Prof. Banner Bill Morgan and Dr. S. H. McNutt, University of Wisconsin, recently discussed the matter at the AVMA office and a proposed organization plan will be presented for consideration to the Executive Board at Detroit.

★ ★ ★

✦ Director of Professional Relations C. D. Van Houweling attended the annual convention of the American Medical Association at Atlantic City, June 6-10, where the new AVMA exhibit, entitled "Brucellosis in Animals," was shown for the first time among the educational displays. A committee consisting of Drs. J. S. Bengston, C. R. Donham, and G. W. Jensen helped plan the exhibit. It will be among the scientific exhibits at the AVMA meeting in Detroit, and will also be available for showing at the request of members of constituent associations.

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1. Otto, G. F., and Maren, T. H. (1947), Filaricidal Activity of Substituted Phenyl Arsenoxides, Science, 106:105, Aug. 1.

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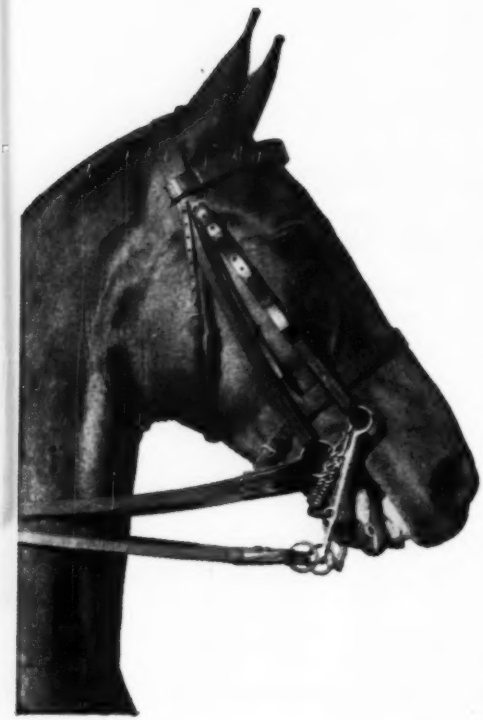

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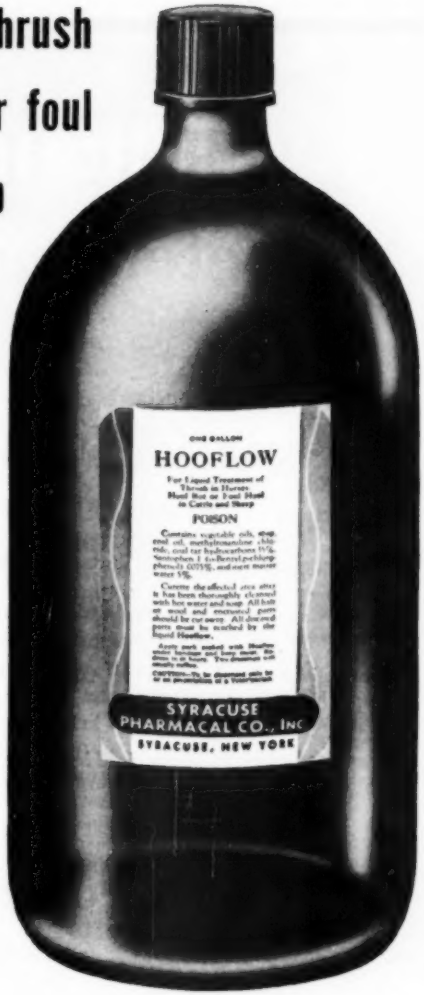

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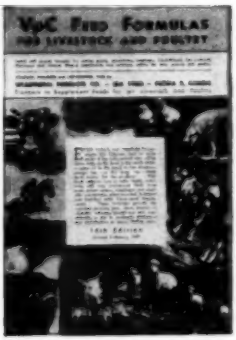

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40 lbs. salt

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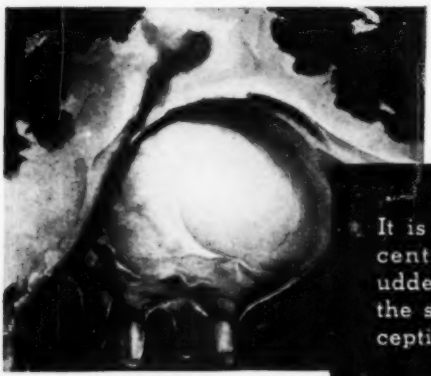

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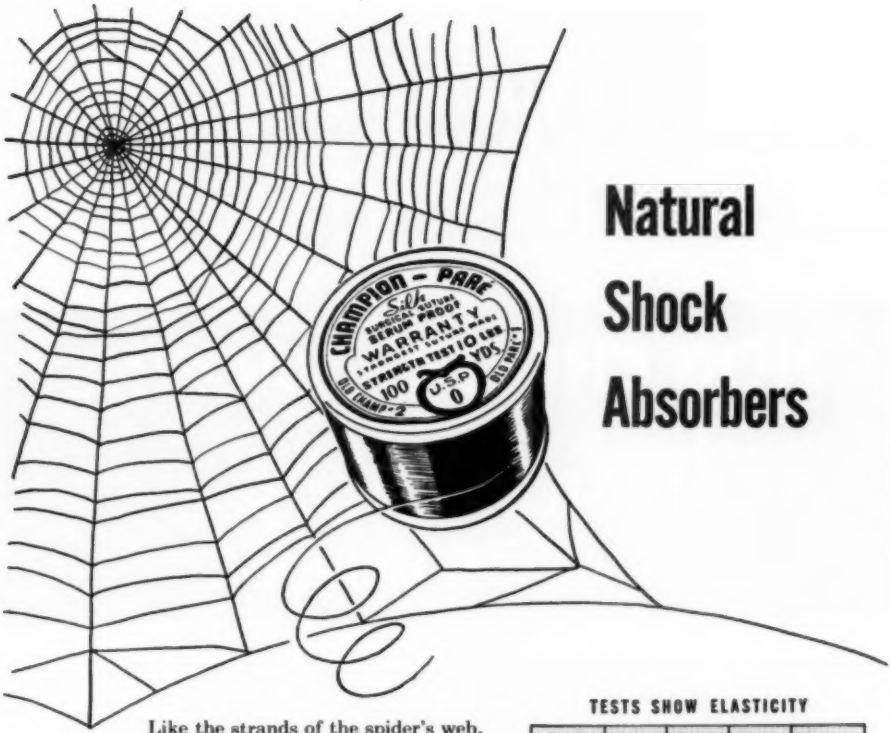
1. Foley, E. J.; Stults, A. W.; Lee, S. W., and Byrne, J. V.: Am. J. Vet. Research 10: 66 (Jan.) 1949.



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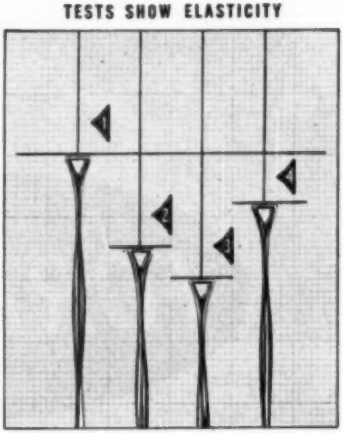

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VOL. CXV JULY, 1949 NO. 868

The Eighth Army Veterinarian Helps to Raise Japanese Public Health Standards

LIEUTENANT MARY GLENN B. HAMILTON
Yokohama, Japan

EIGHTH ARMY Military Government and Japanese veterinary activities in Japan are not spectacular. Conservation of food, protection of health, and lower incidence of disease are programs built from quiet work, day by day, over the entire area of Japan.

Fig. 1—A public health, noncommissioned, officer for the Saitama military government team points out minor sanitation deficiencies in one of the better dairy barns at Saitama. All stages of sanitation, from the dairy barn to the final bottling of milk, is the concern of the Eighth Army Military Government and Japanese veterinary officials.

Squarely before the Japanese people today is the necessity of utilizing effectively their indigenous food supply, and reducing the incidence of diseases stemming from food and animal sources. Any waste which threatens the food supply is a matter of concern to the Japanese government, to the Japanese citizen, and to the American taxpayer.

Japan's supply of indigenous food is too limited to meet the population needs. It is possible, however, to cut down appreciably the losses from diseased and contaminated foods and to minimize spoilage. The task of the Eighth Army Military Government and Japanese veterinarians in Japan is, therefore, a fundamentally important task of education and of constant surveillance.

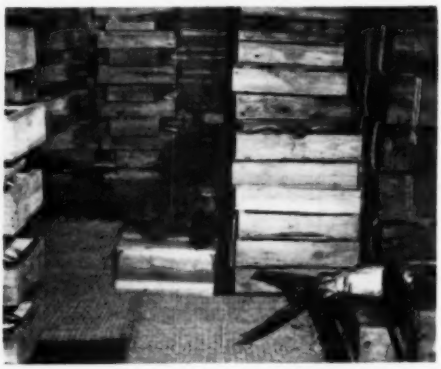
—*Photo by Dr. C. E. Pegg*

Fig. 2—Tokyo Central Market where fish are still handled on the street. Surveillance of fish inspection is a phase of Eighth Army Military Government veterinarians' activity.

Occupation personnel who have watched fishing boats dock with the catch partially

Feature Officer Eighth Army PIO, Yokohama, Japan. Lieutenant Hamilton is a member of the Women's Auxiliary Corps.

spoiled, who have seen marine products handled in a most insanitary manner—dumped on the ground and cleaned there,



—Photo by Dr. C. E. Pegg

Fig. 3—This modern method of piling fish in cold storage was set up at the suggestion of Dr. Charles E. Pegg, Kanagawa and Tokyo Military Government team veterinary officer. The next step is to teach the use of dunnage for uniform air distribution.

piled in dirty boxes, going overlong without adequate refrigeration—realize that marine products so handled can constitute a serious menace to public health. They realize also that, with such handling, too large a percentage of precious food can be utilized only as processed fish or as fertilizer.

There are many barriers to the work Eighth Army public health officials would like to see accomplished in the veterinary medical field. Outstanding handicaps are poorly trained people, lack of money, lack of incentive due to relatively low wages, and a lack of interest throughout Japan in sanitation principals. Nevertheless, progress is already evident.

Public health sections of SCAP and the Eighth Army, working with the Japanese, have been faced with the tremendous task of establishing an adequate veterinary inspection service for Japan. This has included a wide range of activities from quarantine and immunization of incoming animals, to an inspection and vaccination program designed to improve the standards of dairies, slaughterhouses, and food-processing units. Constant surveillance in the field by Eighth Army and Japanese veterinarians and coördination of activities is extremely important if the standards of public health are to be raised and animal disease control furthered—particularly those animal diseases transmissible to man.

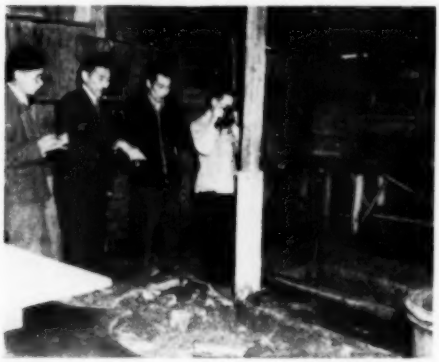
Also important in the over-all program is the provision of proper facilities for training veterinary personnel. Although Japan has some excellent veterinarians, trained at the old imperial universities of Tokyo and Hokkaido, too large a number of the men holding certificates when the occupation began were merely veterinary technicians with education at high school level.

In order to provide such people with additional training, and also to afford refresher courses for graduates of regular veterinary schools, a two-month refresher

—Photo by Dr. C. E. Pegg

Fig. 4—Eighth Army Military Government and Japanese veterinarians make constant effort to increase Japanese knowledge of modern dairy methods to insure a safe milk supply. This is one of the more modern Japanese dairies in Tokyo.

course was set up in January, 1949, at the Institute of Public Health, Tokyo. Only one veterinarian from each of Japan's prefectures may attend each session.



—*U.S. Army Photo*

Fig. 5—A slaughterhouse, closed for insanitary conditions, is being photographed by public-spirited newsmen. Their improvement is the responsibility of the Japanese veterinary service.

There are, at present, 16 colleges of veterinary medicine in Japan. Graduating classes must undergo a national examination, aimed to eliminate those who have not acquired a basic professional knowledge in their field. The ultimate aim of the occupation is to raise the educational standards in veterinary medicine to the university level. Every effort is being made to induce Japan's really educated veterinarians to assume their share of the teaching load.

Eighth Army Military Government and Japanese public health sections have also been concerned with an animal disease control program—important, indeed, if effective use is to be made of Japan's food supply. Particularly emphasized is work in bovine tuberculosis, brucellosis, equine encephalomyelitis, rabies, pullorum disease of chickens, and rinderpest. All except the latter are enzoötic in Japan. A large laboratory has been built in Hyogo prefecture for the production of rinderpest vaccine, so that spread of this disease from nearby Korea, where it is enzoötic, may possibly be avoided.

Fig. 6—Eighth Army Military Government veterinarians are charged with surveillance of the Yokohama Animal Quarantine station. Here, Japanese Lara goats are being unloaded into barges for transport to the station, where they will be held until distributed to welfare, educational, and agricultural institutions and to individual Japanese farmers. Many concerned occupation personnel, and the more far-seeing Japanese, are enthusiastic as to the future usefulness of goats in the Japanese economy. Goats lend themselves to the small acreage of the Japanese farmer.

—*Photo by Dr. C. E. Pegg*

Fig. 7—The Tokyo veterinarian in the Japanese public health section is inspecting cured bacon. The dark, hanging sausages have already been cured; those in the foreground are awaiting the curing process.

—*Photo by Dr. C. E. Pegg*

Fig. 8—At this Tokyo municipal slaughterhouse, the prefectural veterinarian is conducting an organ and carcass postmortem examination to determine fitness of meat for human consumption. ..Eighth Army Military Government maintains close surveillance over such houses, and constantly instructs in methods of postmortem examination.

Fig. 9—Dr. Charles H. Stengle, Sidney, Ohio, Eighth Army veterinarian for the Kanto Military Government region, examines a cow for mastitis as Dr. Gunji Schizuchi, Japanese prefectural veterinary chief, looks on.

Fig. 10—Blood specimen examination of chickens for bacillary white diarrhea which causes a high mortality in baby chicks and injures the productivity of hens. Eighth Army Military Government and Japanese veterinarians are working to reduce the incidence of white diarrhea in Japan's poultry. ..If tests are positive, the diseased chickens must be destroyed.

Bovine tuberculosis has long been present in Japan. Military government veterinarians are, at present, instructing Japanese personnel in the technique of intradermal testing—a procedure more

Fig. 11—Japanese veterinarian Takeshi Yamamoto is drawing samples of blood to be tested for brucellosis.

efficient and accurate than the subcutaneous method formerly used by the Japanese.

Brucellosis (Bang's disease or infections abortion) which results in a tremendous calf-crop loss and can cause undulant fever in man, is another disease upon which work is being done.

Theoretically, Japanese veterinary inspection of foods and food purveying and processing establishments is satisfactory. Every slaughterhouse in Japan is supervised by a veterinarian responsible for the postmortem procedures and the sanitary condition of the establishment. However, sanitary conditions and standards are appallingly low.

Major Karl H. Willers, V. C., Eighth Army Military Government, tells the following illustrative incident. At one large slaughterhouse in a Japanese city, he found employees carrying their bloody butchering knives in old leather scabbards which, of course, could not be sterilized. Recommendation was made that a simple metal holder should be adopted. At the next inspection, each employee displayed his new copper knife sheath. Inside each was the filthy leather scabbard. Education in sanitation must be made a part of Japanese training.

The problem cannot be solved in Japan, however, Eighth Army public health officials feel, until the Japanese people realize the importance of sanitation. The Japanese, themselves, must demand as their right that each step in the handling of their food is safeguarded—that trained men serve as inspectors of all food sources. They must also demand rigid inspection of food producers and food handlers, rigidly enforced sanitary standards, punishment of violators, and a coördinated plan to minimize animal diseases in Japan. The

—*Photo by Dr. C. E. Pegg*

Fig. 12—Eighth Army Military Government public health men are particularly interested in teaching the Japanese the use of modern machinery and the importance of personal hygiene. Here, a new automatic bottling machine in a Japanese dairy replaces the usual method of using a dipper or a hand manipulated rubber hose. Note, however, the unhygienic outfit of the worker.

framework is here for effective control when education and realization of the importance of sanitation becomes a part of Japanese thinking.

Are You Cheating Yourself?

Some of the ways in which one may cheat oneself are: joining local, state, and national veterinary medical associations and not participating in the activities of these groups; registering at professional meetings and then shunning not only the regular sessions but also the off-the-record discussions with fellow practitioners about current problems; subscribing to journals and magazines and then not reading them; hearing reports on new surgical procedures, new theraputic agents, and sound practice builders and then failing to use them.

Any time a man fails to make the best possible use of that for which he has paid (in time or money), he is cheating himself.

What We Know About Brucellosis*

Definition

Brucellosis is a specific infectious disease of animals and man caused by bacteria of the genus Brucella. The three known types of this genus, along with the respective species of domestic animals most commonly affected, are: (a) *Brucella abortus*—cattle; (b) *Brucella suis*—swine; and (c) *Brucella melitensis*—goats.

In cattle, brucellosis also is called Bang's disease and contagious abortion; in swine, contagious abortion and Traum's disease; in man, undulant fever or, when caused by *Br. melitensis*, Malta or Mediterranean fever.

History

1887—Robert Bruce isolated the microörganism causing Malta fever.

1896—Bernard Bang found the microbe causing bovine contagious abortion.

1904—British government appointed a commission on "Malta fever" which found half of the goats on Malta infected.

1906—British army ordered all goats' milk to be boiled, after which the military incidence of Malta fever dropped rapidly.

1911—"Undulant fever" was found among goat-herding families of Texas.

1914—Organism causing contagious abortion in swine isolated.

1917—Alice Evans found that the organisms isolated by Bruce and Bang were almost identical.

1923—Organisms causing porcine contagious abortion recovered from patient with undulant fever at Baltimore.

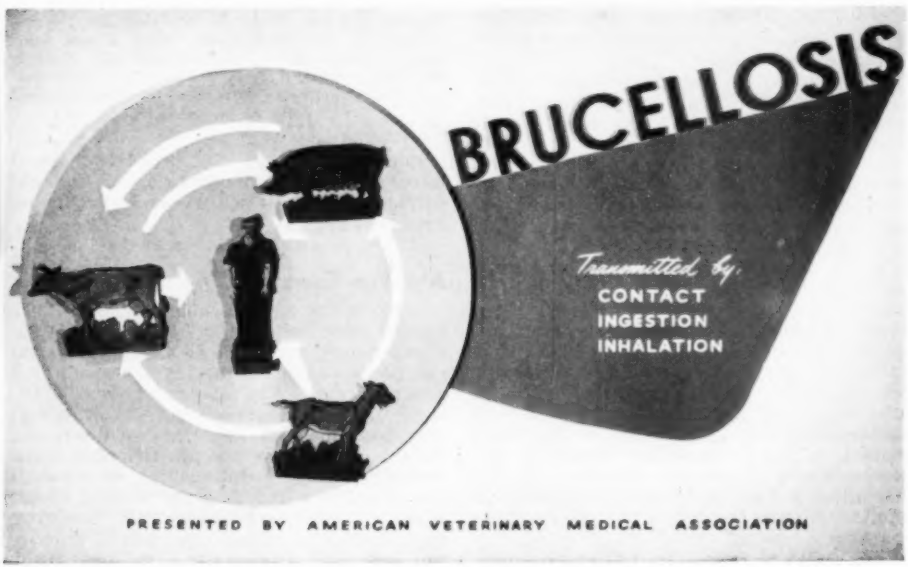
1927—United States Public Health Service collected reports on undulant fever.

1934—Federal-state program of testing cattle and eliminating infected animals begun.

Importance to the Livestock Industry

Experienced cattle breeders know that brucellosis is a serious and costly disease, but it is doubtful whether many are aware

*Abstract of article entitled "What Is Known About Brucellosis" by R. W. Smith, R. R. Birch, C. P. Bishop, C. R. Donham, and R. L. West, in the *Proceedings, 52nd Annual Meeting of the U. S. Livestock Sanitary Association*, Denver, Oct. 13-15, 1948. The complete paper is available in pamphlet form from the secretary-treasurer, Dr. R. A. Hendershott, Trenton, N. J.



Center panel of AVMA brucellosis exhibit prepared for the American Medical Association Convention, June 6-10, 1949, at Atlantic City. The animals rotate around the man in the center, with lighted arrows depicting transmission between species.

of the diversity and full extent of its ravages. The losses in calves, felt most keenly by breeders of purebred cattle, are readily apparent. But the losses caused by temporary and permanent sterility, decreased milk yield, breaks in the ranks of valuable purebred families, and lower sale value of infected cattle often escape accurate appraisal because they are not spectacular. Brucellosis attacks from many directions.

Probably about 5 per cent of the cattle in the United States have brucellosis, and the consequent economic loss to the livestock industry has been estimated at more than $100,000,000 yearly.

CONTROL AND ERADICATION

Control and eradication of the disease in animals is predicated on early, accurate diagnosis, which is readily accomplished by use of the blood-agglutination test. Since practically 95 per cent of the cattle in the United States are free of brucellosis, the first concern in any control program is to prevent the spread of the disease to noninfected animals. The blood testing of animals, transported and introduced into herds, to prevent transmission is essential and fundamental to control.

Careful sanitation and hygienic practices within the herd further serve to prevent transmission. Use of maternity stalls, disinfection, frequent herd tests, and isolation and testing of replacement animals are advised.

The development of resistance to infection by immunization is a valuable adjunct to the control program. Vaccination of calves (and, in emergencies, vaccination of unaffected adults) with strain 19 vaccine is commonly practiced and highly effective. However, good herd management and the hygienic practices listed heretofore are equally important, since the resistance developed by vaccination can be overwhelmed by severe exposures.

The final step toward eradication is removal of infected animals from the herd. Such animals, detected by means of the blood test, should then be sold for slaughter, thus removing the source of infection.

Essentially the same procedures suggested for the control of the disease in cattle will serve for hogs. Exceptions are that there is no effective vaccine for swine and that the blood test must be used on a herd basis rather than for individual animals.

There is no therapeutic agent of proved value, as yet, for treatment in either species. It is readily apparent, therefore, that prevention and eradication are of paramount importance.

PUBLIC HEALTH ASPECTS

The first reasonably authentic case of human brucellosis in the United States was reported in 1905, although there undoubtedly were previous cases that went unrecognized. Since then, the number of officially reported cases has increased to around 7,000 annually, and some observers believe that the reported figures represent only a part of the total incidence. The fact that more human cases are being reported each year, coupled with the fact that many cases never come to the attention of physicians, lends weight to this belief.

Difficulty in diagnosis is another reason for the inadequacy of human brucellosis data. Reliable diagnostic techniques are not yet employed in all laboratories.

Young adult males appear to be most susceptible. Children less than 14 years of age rarely contract the disease, and above that age the proportion of reported cases in males as compared with females is about 4 to 1.

There also is a wide variation in the incidence in occupational groups. The rate is comparatively high among farm workers and packing house employees, due to direct contact with Brucella-infected livestock and fresh livestock products. Many veterinarians and laboratory workers also acquire brucellosis.

Brucellosis is primarily a disease of cattle, swine, and goats; however, horses, dogs, and other species are susceptible. Although the relative importance to human health of the various susceptible species cannot be measured statistically, it is well known that cattle and swine are responsible for most of the human cases in the United States. In former years, it was believed that human brucellosis was acquired primarily, if not solely, by ingestion of infected raw dairy products, but later studies showed that the infection also can be acquired through the skin, especially when abraded, and through the conjunctiva. Hence, major sources of human infection are raw dairy products and infective animal discharges, either ingested, inhaled, or otherwise acquired through contact.

It is commonly considered that man is most susceptible to *Br. melitensis* (goat type), slightly less so to *Br. suis* (swine type), and somewhat less susceptible to *Br. abortus* (cattle type). The intensity and violence of the symptoms produced in man also decline in the order given above, with *Br. melitensis* usually causing the severest cases. On the other hand, opportunity for human exposure to the three types of Brucella frequently is in the reverse order.

Regardless of the type and source of infection, the human disease is likely to be serious and debilitating. Most cases are of long duration, but few are fatal.

Foot-and-Mouth Disease Breaks Out in Vaccinated Mexican Cattle

Worries of foot-and-mouth disease campaign leaders over failure of Mexican-produced vaccines to give adequate length of immunity were amplified by a fresh outbreak recently in a wide, vaccinated area only a quarter of a mile from the northern quarantine line.

The break was discovered in vaccinated cattle herds between San Luis Potosi and Lagos de Moreno, about 384 miles southwest of Brownsville, Texas. Large numbers of campaign personnel were rushed from surrounding areas in an attempt to hem the infected territory and block further spread. All stricken animals were slaughtered and extensive disinfection operations were instituted.

Official reports issued the latter part of May did not state the interval between vaccination and appearance of the disease. But the apparent gravity of the situation was keynoted by General H. H. Johnson, co-director of the foot-and-mouth disease commission, who said, "This is the most serious setback we have experienced in the past eight months." He intimated that the northern quarantine line may have to be moved closer to the United States border.

Besides the previously announced fact that vaccine will have to be administered to susceptible animals three times a year, instead of twice a year as originally planned (*see* JOURNAL, April, 1949: 193), there are several other factors that add to the difficulty of fighting this disease.

Vesicular stomatitis, closely akin to the foot-and-mouth malady and distinguishable from it only by laboratory test, has been found in several parts of Mexico and has necessitated the establishment of a unit for serologic study of viruses, to supplement the animal-inoculation tests routinely used in the diagnosis of both diseases.

Resistance to the program of vaccination and limited slaughter is evident in some sections, notwithstanding the educational efforts of *informadores*, but in most instances it is passive rather than violent, largely manifested by noncoöperation. According to the USDA, the resistance is generated by "unscrupulous cattle buyers who, working ahead of the first vaccination brigades, start rumors that vaccination will kill cattle or make them sterile," so that they can buy them under market prices. On the other hand, an observer for United States livestock interests blames the unrest mainly on "communist influences."

The Mexican vaccine-producing laboratories, directed by U.S. BAI and Mexican veterinarians, reportedly will be able to produce sufficient doses for the triple vaccination of Mexico's 12 to 14 million susceptible animals. Observers view this as perhaps the only bright prospect in the drive for victory over this disease. The vaccine accomplishment becomes even more noteworthy in the light of current foot-and-mouth disease epizoötics in western European nations that are draining virtually every dose of vaccine the laboratories there can produce. Had the Mexican-United States commission continued to rely on these sources for part of their supply, instead of building their own laboratories as they did a few months ago, the campaign would now be bogged down.

Alopecia in dogs is commonly associated with maladjustment of the sex glands.—*C. P. Zepp, Sr., D.V.M., New York.*

—Photo by Dr. F. C. Man

Spraying equipment used in Mexico to disinfect vehicles in the infected area.

A New Method of Intramedullary Pin Fixation

SALO JONAS, D.V.M.
New Haven, Connecticut

THIS PAPER describes 4 cases of intramedullary pinning in femoral fractures. Case 1 uses the pin and method as described by Frick, Witter, and Mosier,[1] and Brinker.[2] Case 2 describes intramedullary pinning in an uncommon case of a left coxofemoral luxation and transverse fracture of left femur with maximum over-riding. Cases 3 and 4 introduce a new technique for intramedullary pin fixation which facilitates insertion of the pin through open reduction, at the same time securing good anchorage at the distal fragment. This is made possible by using a stainless steel pin of varying thickness, sharp at both ends.

CASE 1

A 9-year-old, mixed, male terrier was presented with a two-week-old, comminuted fracture of the right femur and greatly edematous leg. The case was checked by several veterinarians before reaching this office, and given up as hopeless. However, in order to please the owner, and to make the dog more comfortable, a Thomas splint had been applied. Although prognosis was unfavorable, due to the displacement of the multiple loose fragments and the fact that the fracture was of two weeks' standing, it was decided to try intramedullary pin fixation.

The dog was put under full nembutal anesthesia, and, after the area around the hind quarters and femur was shaved and thoroughly disinfected, a ½-in. incision was made medial to the trochanter major. With the help of the larger Kirschner chuck, the pin was inserted into the cortex of the proximal fragment through application of back-and-forth quarter rotary turns, exerting strong pressure against the bone, and at the same time applying pressure on the trochanter against the acetabulum to prevent coxofemoral luxation. Because this fracture was of two weeks' duration, we resorted to open reduction to remove interposed muscular tissue, and curetted to freshen the opposing ends of the femur. The pin was then pushed through into the medullary space and through the cortex of the distal fragment. If the pin is in proper angulation, it will slip into the medullary canal with very little pressure. A combination of urea and sulfonamide crystals was dusted over the exposed bones, and the area infiltrated with aqueous solution of penicillin. Muscles were sutured with catgut, and the skin with silkworm gut. At the distal end, a drain was inserted. The pin was left sticking out about 1 in. at the trochanter, and the skin around it was dusted with a sulfonamide and sealed with waterproof adhesive tape to prevent contamination. Aftercare consisted of administering 300,000 units of penicillin in monostearate daily for a few days, and controlling edema by a bandage

Fig. 1—Case 2. Radiograph showing coxofemoral luxation and jagged transverse fracture of the left femur with maximum over-riding.

over the hock, and gentle upward massage. The ration was enriched with plenty of meat, calcium phosphate, and vitamin D. The drain was removed on the second day, and silkworm skin sutures were removed on the sixth day. The pin was extracted on the nineteenth day, using a chuck with gentle rotary motion. Immediately after the extraction, a slight hemorrhage occurred,

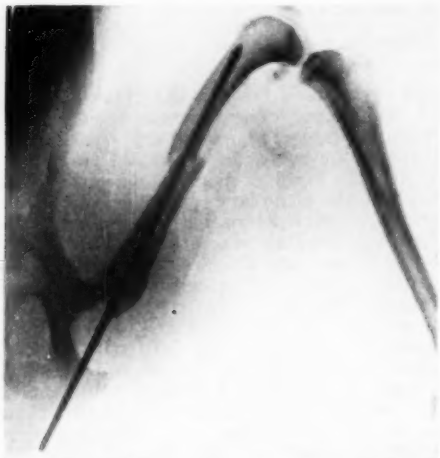


Fig. 2—Case 2. Radiograph showing reduced luxation, intramedullary pin fixation. Note slight displacement.

and, in order to minimize the danger of infection, aqueous penicillin was injected into the medullary canal. The dog was able to put some weight on the leg a few days after the operation. Following the extraction of the pin, there was good union, and the dog retained full use of the leg.

CASE 2

A 1-year-old male hound of mixed breed was presented with a left anterior coxofemoral luxation and transverse fracture of the left femur with maximum over-riding. The dog was prepared for surgery in the usual manner under aseptic conditions. An intramedullary pin was inserted medial to the trochanter, extending through the proximal fracture of the femur. An incision was then made along the line of the femur, the upper fragment located, and the pin pushed through so that the lower end protruded about 2 in. This protruding point of the pin and upper fragment of femur were grasped with the right hand, and the upper end of the pin with the left hand. Reduction of the luxation was effected by counterclockwise rotation, traction, and slight abduction. The pin was then pushed back sufficiently to enable its introduction into the canal and the epiphysis of the lower fragment. As there was extensive overriding and the leg was edematous due to trauma for over twenty-four hours, great difficulty was encountered in approximating both ends of the femur, and a fulcrum was used to pry the ends apart. The administration of penicillin, suturing, drainage, and diet were followed as described in case 1. As the dog was too active, and there was excessive seepage at the trochanter, a Thomas splint was applied on the eighth day to better support and to immobilize the leg. The pin interfered with the ring of the Thomas splint and was removed on that day instead of leaving it in for the usual time. Figure 2 shows reduced left coxofemoral luxation and intramedullary pin fixation. The pin used was too thin for the intramedullary canal, and

Fig. 3—Case 3. Radiograph showing comminuted fracture of right femur with loose fragments in 1-year-old Pomeranian.

as there was great difficulty in perfectly approximating both ends of the bones, a slight displacement occurred, although both ends were still in apposition. This slight displacement was responsible for the rather large callous which developed. However, both legs were of perfectly even length, the dog showed no lameness, and, forty-three days after reduction, the owner claimed that the dog was able to climb a 6-ft. ladder.

CASE 3

This case illustrates the use of a new type of intramedullary pin similar to the one used in the previous cases, with the exception that both ends are sharpened in order to facilitate the introduction of the pin into the intramedullary space through open reduction, using a new technique. The patient was a 1-year-old, male Pomeranian with comminuted fracture of the right femur and loose fragments. The dog was anesthetized with nembutal and prepared for open reduction as described before. However, instead of introducing the pin at the trochanter into the intramedullary space (a process which is sometimes difficult), the proximal fragment of the femur was located and exposed. It was then grasped with the index finger and thumb and the point of the pin inserted upward into the canal. Applying slight pressure with the chuck and a back-and-forth rotating movement, the pin was pushed out through the trochanter. In other words, the technique of introducing the pin into the upper fragment was reversed, and the whole process thus made easier and less time-consuming. The pin was pushed up all the way through until its lower end protruded about ¼ in. from the proximal fragment. The distal end was then approximated, and the point of the pin inserted through the medullary space and worked into the epiphysis. No attempt was made to remove any loose fragments of bone, unless they were badly contaminated due to the compound fracture and completely denuded of periosteum. Loose fragments were aligned to the larger bones as close as possible and dusted with urea-sulfonamide powder. Final operative procedures and aftercare were followed as described in case 1. The protruding point of the pin was covered with tape and the pin was removed on the twentieth day. The dog showed no discomfort after the operation, and used the leg the next day. This patient was observed for three months after the removal of the pin and showed no signs of lameness.

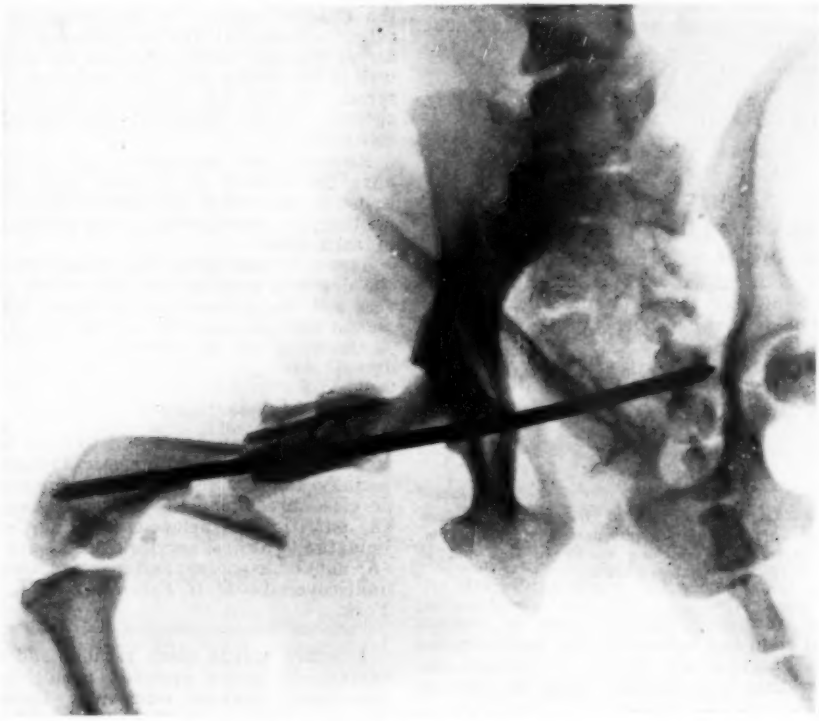


Fig. 4—Case 3. Radiograph after intramedullary pin fixation, showing double-pointed pin.

CASE 4

A male Springer Spaniel, 20 months old, was presented with a comminuted fracture of the right femur, with loose fragments. The patient was prepared in the usual manner. The double-pointed pin was introduced by open reduction, using the technique described in case 3. The pin was removed after nineteen days. There was no impediment in locomotion, and both legs remained equal in length.

SUMMARY

1) In intramedullary pin fixation, it is not advisable to remove larger fragments of bone as they seem to work as small splints, giving support and nourishment to the bone during healing.

2) In order to get optimum results, it is necessary to use pins of sufficient diameter to fill the intramedullary space, and to leave them in place nineteen or twenty days.

3) The new double-pointed, stainless steel pin makes possible an improved method of intramedullary pin fixation, allowing easier insertion into the intramedullary canal through open reduction without sacrificing secure anchorage.

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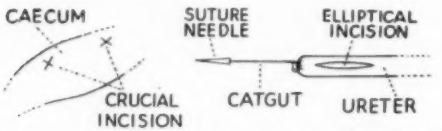
Transplanting the Ureters in the Dog*

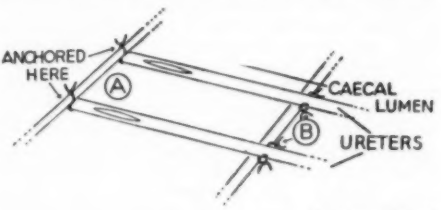
The patient was presented following a street accident with severe abdominal bruising, resulting in retention of urine and continuous drip of overflow. In spite of treatment, including a laparotomy to remove blood clots and adhesions, the condition became progressively worse. It became obvious that the trouble must be due to paralysis of the bladder and/or its sphincter.



—*Veterinary Record*

Fig. 1—Relative positions of the crucial incisions through which the ureters were passed into the cecum. Also, method of attaching needle to free end of severed ureter.

The animal was anesthetized and, using the previous operation incision, the ureters were ligated and severed close to the bladder. Two small crucial incisions were made along one aspect of the cecum. The free ends of the ureters were sutured through and a suture needle affixed to the ends (fig. 1). An elliptical incision was made in each ureter as close to the end as possible. Each ureter was drawn through the crucial incision in the cecum by the catgut attachment, the needle being pushed across the cecal lumen, through the opposite wall of the cecum and then anchored to the serosa (A) (fig. 2). The ureters were then sutured to the cecum at the crucial incision (B).



—*Veterinary Record*

Fig. 2—Schematic position of ureters as anchored to wall of cecum.

Recovery was uneventful and in twelve days the patient could pass feces-stained urine in one action and semi-solid feces in another, *i.e.*, both actions being independent of each other.

Three months after the transplantation, the dog was making slow but steady progress and the authors saw no reason why he should not continue for several years.—*H. M. Stanton, D.V.M., Illinois.*

*Robert S. Townson, M.R.C.V.S., and Doris H. Crawford, M.R.C.V.S.: Transplanting the Ureters in the Dog. Vet. Rec., *61*, (Feb. 5, 1949):66.

Causes of Infertility

Infertility may be caused by: (1) hormonal imbalance; (2) genetic factors, especially those associated with inbreeding or close breeding; (3) infectious agents; (4) nutritional deficiencies; (5) age, either immaturity at first service or excessive age; (6) nonviable sperm; and many factors still undiscovered.—*M. G. Fincher, D.V.M., New York.*

Diseases spread more rapidly and more extensively under crowded conditions — respiratory diseases, especially. Crowding increases pollution with bacteria and parasite ova.—*T. L. Steenerson, D.V.M., Indiana.*

Scrotal Neoplasms — A Report of Two Cases in the Dog

CHARLIE N. BARRON, D.V.M.

College Station, Texas

IN MAN, tumors of the epidermis of the scrotum resemble those of the skin, generally, in structure and behavior. However, basal cell growths and tumors of the cutaneous glands are very rare in this site.[1] Epidermoid growths of the scrotum of man are usually associated with occupational or other exposure to carcinogenic hydrocarbons, primarily in coal or petroleum products.[1,3]

There is a paucity of information on scrotal neoplasms in the domestic animals. Jackson[4] mentions the scrotum as a typical site for venereal lymphosarcoma of the dog. He also records an acanthoma of the scrotum of a dog and a hemangioplastic endothelioma of the scrotal skin of a 5-year-old Tamworth boar.

Feldman[5] records a fibrosarcoma of the scrotum of a dog, a melanoblastoma of the scrotum of a horse, and a malignant melanoma of the scrotum of a dog, which recurred one year later with subsequent metastatic involvement of the parietal peritoneum.

Two cases* of scrotal neoplasms in the dog are reported in this paper.

CASE REPORTS

Case 1.—The subject was a 4-year-old, white, male English Bulldog. It was first hospitalized Nov. 9, 1948, with an indolent wound of the scrotum. It had been treated for screw-worms at home some time previously, and the resultant wound had failed to heal. The scrotal wound was treated topically with a commercial antibacterial preparation. The dog was released from the hospital on Dec. 1, 1948, with the wound apparently healing normally; however, the wound failed to heal, and the dog reëntered the hospital on Feb. 2, 1949. On February 5, the ulcerated lesion was removed surgically and the wound closed by apposition. The wound had apparently healed completely, when the patient was discharged on Feb. 12. However, it was returned several weeks later to have a small abcess in the wound area treated.

Gross pathology.—The circular, ulcerated area was located on the most ventral aspect of the scrotum and measured approximately 1¾ in. in diameter and ⅜ in. in thickness when removed. It had a moist, granular, pink-tinged surface. The central portion was slightly depressed and the edges were slightly raised. The epithelial margin was clean and pink.

Histopathology.—The neoplastic tissue extended throughout the thickness of the skin, with some invasion of the dartos, and was made up of an irregular proliferation

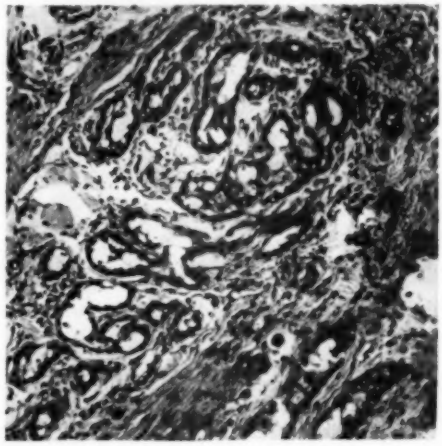


Fig. 1—Glandular formation of neoplastic tissue in case 1. Hematoxylin and eosin stain. x 100.

of epithelial cells of granular type. There was some undermining of the epidermis of the rim of the ulcer. The type cells had a rather large vesicular, hyperchromatic nucleus with a prominent nucleolus. They were usually arranged in thin irregular cords with frequent formation of glandular spaces resembling sweat glands (fig. 1, 2). A few areas of squamous metaplasia were present. Mitotic forms were numerous. The stroma was primarily the remains of the dermal connective tissue. There were

*Cases 1 and 2 were obtained for examination through the courtesy of Drs. W. W. Armistead and W. V. Lumb, respectively, Department of Veterinary Medicine and Surgery, Texas A. & M. College, College Station.

Grateful acknowledgment is made of the aid and advice rendered by Dr. John H. Milliff, Department of Veterinary Anatomy, Texas A. & M. College, College Station.

a few foci of neutrophils and the formation of some granulation tissue, especially near the surface.

Diagnosis.—Adenocarcinoma of sweat gland origin.

Case 2.—The subject was a 4-year-old, black, tan, and white, male mongrel stock dog. It first entered the hospital on March 4, 1949, with the history of an indolent ulcer of approximately six months' dura-

Fig. 2—Higher power of portion of glandular field in figure 1, case 1. x 600.

tion on the ventral surface of the scrotum. The ulcerated area was surgically removed on March 4. The wound was closed by direct apposition, and the patient was discharged from the hospital. The dog tore out the sutures and was rehospitalized on March 7. The entire scrotum and both testicles were removed on March 7. The wound healed readily and the sutures were removed on March 18. The patient was discharged from the hospital on March 20.

Gross pathology.—The circular lesion was located on the most ventral aspect of the scrotum. The moist, granular surface was nearly flat with a slightly depressed center and raised edges. The epithelial margins were pink and relatively even. When removed, the lesion measured 1⅛ in. in diameter and averaged approximately ⅜ in. in thickness.

Histopathology.—The covering epidermis of the lesion had been destroyed and replaced by a surface layer of necrotic tissue containing numerous neutrophils and some bacterial colonies. Neoplastic tissue, usually consisting of cornified epithelial cells, frequently projected onto the surface. The

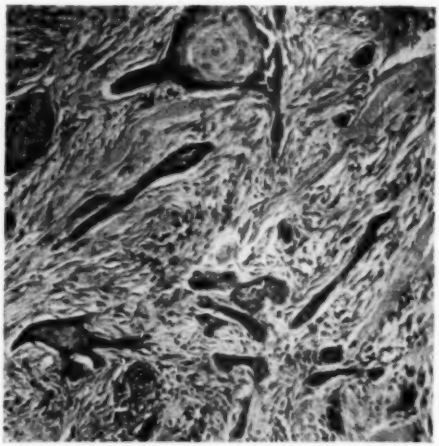


Fig. 3—Small islands of neoplastic tissue in fibrous stroma (in case 2). Hematoxylin and eosin stain. x 100.

neoplasm consisted of irregular cords and clumps of epidermal cells infiltrating the underlying tissues (fig. 3). Associated with these neoplastic masses was the formation of granulation tissue frequently infiltrated near the surface with neutrophils and, in the deeper layers, with reactive round cells. The neoplastic nuclei were hyperchromatic and mitotic forms were frequent. Cornification was extensive, and numerous epithelial pearls were present.

Diagnosis.—Squamous cell carcinoma of the skin of the scrotum.

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[5]Feldman, W. H.: Neoplasms of Domesticated Animals. W. B. Saunders Co., Philadelphia, Pa., (1932):90, 251, 255, and 346.

Infertility and Sunshine

There is apparently a relation between infertility in mink and lack of sunshine. Often, when kept in sheds not penetrated by a moderate amount of sunlight daily during the winter months prior to the breeding season, mink do not reproduce. Feeding cod liver oil does not seem to offset the lack of solar light. The best precaution is to orient the breeder sheds in a north-south direction, or to keep the animals on the south side of the sheds running east and west.—*T. T. Chaddock, D.V.M., National Fur News, Feb.*, 1949.

Traumatic Pericarditis

Recovery from traumatic pericarditis seldom occurs in response to medicinal treatment, says Dr. F. E. Brutsman, of Traer, Iowa (*Iowa Vet., 20*, (March-April, 1949): 9-12). The alternatives are slaughter and operative procedure. If justified, the latter can be considered when the pulse is under 80 and the temperature under 104 F. A more rapid pulse and a higher temperature indicate diffuse peritonitis and call for delay of surgery. Elevate the front quarters, administer mineral oil and stimulants, and wait for the acute symptoms to recede.

Swine Anesthesia via the Vena Cava

Carle and Dewhirst[1] described a method of bleeding swine from the anterior vena cava, which was recently commented upon by Sippel.[2] We have found this method to be practical.

Our success with the procedure encouraged its trial as a means of introducing the combination chloral, magnesium sulfate, and pentobarbital anesthetic. Ear vein administration had always given me trouble. The vessels are small and require the use of small needles. Confined animals resent ear puncturing and shake their heads at inopportune moments. Consequently, the vena cava promised an easier way of inducing anesthesia. The procedure works very well for me.

A satisfactory method is to pull a hog to a post with a rope or hog holder in place behind the tusks, and with the snout elevated as much as possible. With the needle introduced as described by earlier workers, the blood drains by gravity as soon as the vena cava is entered. A little confusion resulted when the needle was introduced with animals lying on their backs. Blood does not flow uphill, making aspiration with a syringe desirable to determine when venal puncture had been accomplished.

A 4-in., 18-gauge needle is used; I have been reluctant to use instruments of larger bore. With the animal in a standing position, I use a syringe to introduce liquids. Gravity-flow outfits must contend with blood that is naturally draining down through the needle. This same method may be used for giving sodium-sulfapyridine and calcium-gluconate solutions in the treatment of febrile conditions and milk fever in sows. The technique is simple and it has many uses in swine practice.—*J. W. Bailey. D.V.M., Fort Atkinson, Wis.*

[1]Carle, B. N., and Dewhirst, W. J.: A Method of Bleeding Swine. J.A.V.M.A., *101*, (1942): 495-496.

[2]Sippel, W. L.: Bleeding Hogs from the Vena Cava. Jen-Sal J., (Jan.-Feb., 1949): 445.

Unsoundness and Heredity

The age-old discussion of the part heredity plays in the occurrence of so-called unsoundness of horses is reopened by Dr. V. Tierstein in the *Western Livestock Journal* (May, 1949). After defining terms, Dr. Tierstein bemoans placing a blight on a stallion as a breeding animal because he is afflicted with a low splint, bog spavin, thoropin, or curb that has never caused lameness. In his opinion, these conditions should be classified as blemishes rather than unsoundnesses.

To further substantiate his arguments in support of these statements, the following conditions are listed as the possible cause of the so-called unsoundness: (1) stress, strain, and pounding; (2) rapid development and early maturity; (3) improper diets; (4) faulty hoof care; (5) injuries such as blows which are in excess of the stresses and strains; (6) specialization for speed; and (7) faulty conformation and action.

"The hereditary theory of these unsoundnesses should be junked unless someone can come up with factual proof or at least more sound theorizing on its behalf," he concludes.

Today, 90 per cent of chicks in the United States are commercially hatched, compared with 30 per cent in 1932. The per capita egg consumption between these years mounted from 311 to 380, per annum.

When a 50 per cent solution of glucose is injected intraperitoneally, it causes extensive extravasation and discomfort — especially in baby pigs.

CLINICAL DATA

Clinical Notes

Autopsies on more than 4,000 mink showed pneumonia to be the biggest single cause of death.

Keeping the diseases of farm animals down to an irreducible minimum is the background of successful farming and the basis of high standards of living.

Using the ring test (ABR), one veterinarian can test 50 to 60 herd, or about 800 cows, in a day, whereas blood-testing this number takes about ten days.—*Robert Graham, D.V.M., Illinois.*

When livestock must be consistently medicated to maintain health, there is something fundamentally wrong with the program of sanitation and management.—*P. P. Levine, D.V.M., New York.*

Dyspepsia or indigestion of baby pigs is often functional. It may be caused by sudden changes in atmospheric conditions. Such cases respond if transferred to warm quarters, usually requiring no other treatment.—*H. C. H. Kernkamp, D.V.M., Minnesota.*

It has been suggested that records be kept of all outbreaks of hog cholera and other livestock losses due to the misadministration of biological products and drugs purchased indiscriminately. I recommend that the Iowa Veterinary Medical Association collect this data from practitioners and publish it.—*R. B. Helming, D.V.M., Cresco, Iowa.*

The skin is a defense mechanism of the body and is ten times as pugnacious or resistant to invading organisms as the blood. The other fixed tissues (peritoneum, muscles, brain) are also more active than the blood in stimulating defensive elements in the body. The inescapable conclusion is that immunization is more than a mere production of antibodies in the blood.—*R. L. Kahn, M.D., Michigan.*

A chain twitch, applied just above the hock, provides excellent restraint for handling a cow's foot.

The cow that gives bloody milk can often be helped by injecting formalin (10 to 15 cc.) intravenously, very slowly.—*W. E. Coffee, D.V.M., Kentucky.*

Impactions in horses can be effectively treated by lavage — passing the stomach tube and alternately pumping warm water into the stomach and siphoning back the loosened food particles.

In order to reduce the losses from coccidiosis among feeder lambs, it is important that the lambs be placed on hay for seven to ten days and then built up very slowly to a full grain allowance.—*Lee Seghetti, D.V.M., Montana.*

Silnasol (Searle) is useful in treating ranula, shoeboil, hygroma, etc. Draw off the serous fluid, replace with 3 to 10 cc. of silnasol. In three days, aspirate fluid and repeat; this causes more reaction, and a third injection may be necessary.—*H. T. Cartrite, D.V.M., Texas.*

Pitch poisoning, caused from eating clay pigeons, may affect pigs pastured on the target range twenty years later. It may be recognized by finding a liver that is large, congested, mottled, with red lobules, and with a golden icteric sheen. The tissues are iceteric, also.—*H. C. H. Kernkamp, D.V.M., Minnesota.*

Black disease (acute necrotic hepatitis) of sheep which is caused by *Clostridium oedematis* was added to the list of animal diseases transmissible to man, or at least common to both. A human case was described by the Paris correspondent to the *Journal of the American Medical Association* (Nov. 8, 1948), who suggests that *Cl. oedematis* may account for peracute icterus in the human being.

The Treatment of Heartworm-Infected Dogs with Arsenamide, a Phenyl Arsenoxide

RONALD F. JACKSON, D.V.M.

St. Augustine, Florida

FUADIN, the only drug which has been extensively employed in the treatment of heartworm, has left much to be desired. Improvement is sometimes seen, but more often the results are negative or of doubtful value. Further, fuadin, in common with other trivalent antimonials, is toxic, and it is frequently necessary to suspend treatment short of the prescribed course. The failure of fuadin in veterinary practice is borne out by laboratory studies[2,4,8,9,11] which have shown that usually only living, adult worms, and no dead worms, are recovered after the use of such trivalent antimonials, even though the microfilaria are destroyed in the circulating blood. It has been shown by several of the above workers and others[1] that such female worms may be sterilized. Sterilized female worms may remain alive and otherwise active for nearly a year after treatment.[1] Thus, with fuadin and other trivalent antimonials, the disappearance of microfilaria may be totally misleading to the veterinarian and his client.

Accordingly, interest developed in the report[3] that arsenamide (T.D.C. #970) would regularly destroy the adult worms even though it did not eliminate the microfilaria. These workers report that the adult worms, upon being killed, were swept into the pulmonary artery where they produced extensive infarction of the lungs. Although they report no demonstrable ill effects from such infarction, the confinement of these dogs in small cages, and the early destruction to determine the fate of worms, would not be comparable with conditions in routine veterinary practice and did not permit study of the possible ultimate improvement.

The object of these observations is, therefore, (1) to determine whether improvement of heartworm-infected dogs would follow the use of arsenamide; and (2) to determine the tolerance of the average heartworm-infected dog to the drug and the destruction of adult worms (assuming that they were killed) under conditions of routine veterinary practice.

The 50 animals reported in this paper were average dogs presented for treatment in a veterinary hospital. Dogs of all ages were treated and none were eliminated because of poor physical condition. Ages varied from 1½ to 12 years, with the average at 4½ years. Males and females of many different breeds were included in this group. No attempt was made to improve the general condition of the animal prior to treatment, except in the case of those few in a critical condition. Supportive treatment, such as digitalis, was given to these.

Arsenamide was given at the rate of 0.45 mg. of arsenic (2.25 mg. of drug) per kilogram of body weight, daily for fifteen days. A 1 per cent solution was used; hence, 1 cc./10 lb. of body weight was the daily dose. The drug was injected intravenously into the radial or saphenous vein. Strict precautions were necessary to prevent perivascular leakage, since this drug is very irritating to the tissues, and the slightest drop spilled outside the vein will cause a severe local reaction. Some perivascular leakage did occur in dogs 12 and 20, and the reaction was such that a rise of several degrees in temperature and considerable discomfort to the animals resulted. Antipyretics and sedatives were used, but it was not necessary to discontinue treatment.

The heartworm-infected dogs, seen in routine practice in St. Augustine, fall into four clinical categories, all of which were represented in this series of treatments. For convenience, these classes are designated as follows:

S-0—Asymptomatic cases.

S-1—Dogs with slight symptoms which might be confused with some other condition (such as a slight cough), or symptoms so slight as to make improvement difficult to determine accurately.

S-2—Dogs with typical heartworm symptoms.

S-3—Dogs in critical condition due to heart-

From the Jackson Small Animal Hospital, St. Augustine, Fla.

The writer is indebted to Dr. E. E. Sweebe, Abbott Laboratories, North Chicago, Ill., for supplying most of the arsenamide used. He is indebted, also, to Dr. C. K. Banks of Parke-Davis Co., Detroit, Mich., who supplied, through Dr. G. F. Otto of Johns Hopkins University, the earlier stocks of arsenamide.

I am indebted to Dr. Frederick G. Germuth (pathologist), of the U. S. Public Health Service and the School of Hygiene and Public Health, Johns Hopkins University, for making histopathologic studies of the liver and the occluded vein.

TABLE I—Treatment of Heartworm-Infected Dogs with Arsenamide

Dog (No.)	Breed	Wt. (lb.)	Sex	Age (yr.)	Previous treatment	History and symptoms	Admission classification	Date treatment with 970 completed
11	Spitz	24	M	6	None.	Slight cough.	S-1	4-26-47
13	Boxer	68	F	2	None.	Cough.	S-1	11-25-47
33	Pointer	52	M	2	None.	Cough.	S-1	4-20-48
38	English Setter	37	M	4	None.	Cough.	S-1	5-27-48
39	Boxer	68	M	5	2 yr. prev.	Cough; listlessness.	S-1	5-27-48
42	Pointer	58	M	4	None.	Slight cough.	S-1	6-15-48
43	Pointer	50	M	2½	None.	Slight cough; dyspnea after 15 min. exercise.	S-1	8-2-48
50	Pointer	58	M	3	None.	Cough.	S-1	9-22-48
1	Mixed	51	M	4	None.	Exhaustion following exercise.	S-2	5-25-46
3	Pointer	54	M	4½	1½ yr. prev. with fuadin.	Cough following exercise or excitement.	S-2	9-27-46
4	Mixed	24	M	2	None.	Coughing & gasping attacks 2 or 3 times weekly.	S-2	9-28-46
10	English Setter	46	M	4	None.	Exhaustion after 1½ hr. hunting.	S-2	4-23-47
12	Cocker Spaniel	44	M	5	1½ yr. prev. with fuadin	Cough; inactivity and listlessness.	S-2	6-29-47
14	Spitz	24	M	7	None.	Exhaustion after strenuous exercise; dyspnea after exercise.	S-2	7-10-47
17	Pointer	42	M	5	2½ yr. prev. with fuadin.	Coughed 6-8 mo. prior to treatment.	S-2	8-15-47
21	English Setter	44	M	8	About 4 yr. prev.	Inactivity; stiffness in legs; cough; nephritis.	S-2	10-20-47
23	Hound	44	M	2½	None.	Inactivity for several months prior to treatment; cough.	S-2	11-28-47
24	Scottish Terrier	22	F	6	None.	Inactivity; listlessness; anemia; cough.	S-2	11-8-47
29	Pointer	56	M	6	2 yr. prev. with fuadin.	Cough of several months duration.	S-2	1-31-48
30	Cocker Spaniel	26	F	12	None.	Anemia; appetite poor; cough of several months duration. Heart — coarse systalic murmur. Supportive treatment — digitalis and ferrous sulfate.	S-2	2-18-48
46	English Bulldog	47	M	5	Treated in 1945; again in 1947 with fuadin.	Dyspnea following exercise; inactivity; appetite not as good as usual.	S-2	8-6-48
52	Boston Terrier	24	M	5	None.	Inactivity; tired after exercise.	S-2	10-4-48
5	Hound	30	M	7	None.	Exhaustion following even slight amount exercise; appetite irregular; symptoms of 8 mo. duration.	S-3	10-19-46
6	Cocker Spaniel	19	M	5	None.	Severe anemia; inappetence; inactivity developed several months prior to treatment. Condition improved somewhat after adm. of digitalis. Heart — coarse, systalic murmur with palpable thrill; pulse fast.	S-3	10-19-46
7	Pointer	50	M	8	None.	Inactivity; cough. Heart — coarse, systalic murmur with palpable thrill; pulse fast.	S-3	12-20-46
20	Wire-haired Fox Terrier	10	F	3	None.	Severe anemia; poor appetite; listlessness. Heart — coarse systalic murmur with palpable thrill; pulse rapid. Gen'l condition very poor. Supportive treatment digitalis.	S-3	10-19-47
22	Boston Terrier	12	F	5	None.	Cough; one year duration; had heart attacks; collapsed after exercise; during 2 mo. prior to treatment gen'l condition very bad; anemia, inactivity, poor appetite. Heart — coarse systalic murmur. Supportive treatment during treatment with 970.	S-3	10-25-47
28	English Setter	44	M	....	2 yr. prev. with fuadin.	Gen'l condition very bad; anemia, listlessness; cough; inappetence. Heart — coarse systalic murmur; pulse rapid.	S-3	1-13-48
49	Pointer	55	M	4	None.	Inappetence; anemia; inactivity. Heart — coarse systalic murmur with palpable thrill; pulse rapid.	S-3	8-27-48

TABLE I—Treatment of Heartworm-Infected Dogs with Arsenamide

Symptoms during treatment	Results of treatment
None.	Not reported.
None.	Definite improvement 2 weeks after treatment. Not coughed since.
None.	Cough disappeared; gen'l condition improved.
None.	Cough disappeared.
None.	Condition improved.
Coughed 8-12th days; became listless on 9th day; appetite poor from this time throughout treatment. Developed stiffness in legs on 12th day which lasted until treatment ended. 12th, 13th, & 14th, injection spaced 2 days apart due to poor gen'l condition.	Gene.al condition good. Cough disappeared.
None.	Cough disappeared; dog hunts all day without tiring.
Developed stiffness in legs and soreness on 13th day of treatment; decreased gradually; disappeared 2 days after termination of treatment.	Cough disappeared.
None.	Regained normal activity.
Severe cough during last 5 days of treatment; gradually subsided and disappeared completely 9 days after treatment.	Cough disappeared completely; able to hunt all day without tiring.
Vomited several times on 8th day of treatment & refused to eat; appetite poor 8-12th day; coughed on 15th day; regained appetite 13th day & henceforth.	Coughing and gasping attacks no longer apparent.
Diarrhea from 5-10th day of treatment, and consequent poor appetite throughout rest of treatment. Later found that dog had been subject to attacks of diarrhea; consequently no reason to believe it due to 970.	Was able to hunt during 1947 season without tiring.
Began coughing 3d day of treatment; gradually subsided & disappeared on 9th day; perivascular leakage caused severe local reaction with T.104 on 10th day; appetite poor 8-12th days; normal after that.	Animal active; cough gone.
None.	Regained normal activity; no dyspnea.
Slight cough 10-15th day of treatment.	Cough disappeared; hunted well last season.
None.	Regained normal activity; cough disappeared.
None.	Not reported.
None.	Regained normal activity; no longer anemic or listless; cough disappeared.
None.	Cough disappeared entirely.
None.	Heart murmur much less evident; general condition improved; cough still present, but decreased intensity.
None.	Not reported.
None.	Regained normal activity.
Severe cough last 5 days of treatment.	Developed ascites; destroyed 12-4-46.
None.	Died 11-17-46.
None.	Developed ascites; destroyed 2-9-49.
Coughed 8th to 15th day; perivascular leakage caused T.104 on 11th day; general condition improved during treatment.	General condition good; active & app. good. Heart improved, but murmur still present — 8-10-48 murmur not present.
None. Unable to give 7th & 9th injection due to inability to locate vein — caused by low blood pressure & small size of dog.	General condition improved following treatment. Died 2-22-48.
None.	Died 2 days following treatment.
General condition gradually became weaker; only 8 injections given.	Died 9-4-48.

worm infection. In these cases, supportive treatment (digitalis etc.) was necessary during treatment.

DRUG TOLERANCE AND SYMPTOMS DURING TREATMENT

The asymptomatic animals (S-0) are not tabulated in table 1 for the obvious reason that these animals would show no changes following treatment. This group consisted of dogs of both sexes ranging in age from 1½ to 12 years with the average being slightly less than 4 years. Weights ran from 16 to 72 lb. with an average for the group of 43 lb. Pointer, Setter, Boxer, German Shepherd, Cocker Spaniel, Beagle, Boston Terrier, and Collie were some of the breeds in this group.

Only 2 of these animals had been treated previously with antimony compounds, 1 a year before and the other two and a half years before.

Of the 21 dogs in this group, 17 showed no unusual symptoms during or after treatment. The remaining 4 developed a slight cough, on the eighth to eleventh day of treatment, which disappeared at the termination of treatment or within a few days thereafter. All 21 retained a normal appetite throughout the course of treatment and loss of weight was negligible.

The drug was also well tolerated by S-1 and S-2 groups of dogs in the doses given. Of the 8 dogs classified as S-1, 6 showed no ill effects nor any physical signs of disturbance during or after treatment (table 1); likewise, 9 of the 14 dogs classified as S-2 showed no ill effects.

Average loss of weight during course of treatment was less than 2 lb., which is not unusual for dogs hospitalized for a period of fifteen days. Four dogs gained weight, 1 as much as 6 lb. Several lost 6 lb., and dog 42 lost 7 lb.

All of the dogs in group S-1 (those with slight heartworm symptoms) and those in group S-2 (with typical heartworm symptoms) definitely improved. The symptoms of heartworm infection that had been present before treatment had either markedly improved or had disappeared entirely.

The most characteristic development during treatment was the cough which frequently occurred during the second week of treatment. In addition to the 4 out of 21 animals classified as S-0, 1 of the 8 classified as S-1, 4 of the 14 classified a S-2, and 2 of the 7 S-3 dogs developed such coughs—a total of 11 of the 50 dogs treated.

A few other minor disturbances developed in some cases, including 2 dogs in S-1 and S-2 groups, which did not develop a cough. In every case, these symptoms cleared up before the end of treatment. Most interesting symptoms were those exhibited by dogs 42 and 50. These animals developed a stiffness and soreness of the legs which lasted for several days. Both recovered rapidly following termination of treatment.

It is interesting to note that the symptoms were not necessarily most pronounced at the end of the course of treatment; in other words, continuing the injections did not necessarily aggravate the symptoms. In fact, in some cases, symptoms had already begun to subside before the fifteenth day. In every case where symptoms appeared during treatment, they disappeared rapidly after completion of treatment.

Thus, of the 43 dogs in groups S-0, S-1, and S-2, 32 suffered no ill effects from the treatment. This includes some animals in poor physical condition. Dog 21, for instance, was an 8-year-old with chronic nephritis; it withstood the entire course of treatment without a sign of trouble.

The 7 dogs classified on admission as being in critical condition due to heartworms (S-3) constitute a very different group. It will be noted (table 1) that 1 of them (dog 22) suffered such low blood pressure on two days that the collapse of the veins made therapy impossible on those days, while another (dog 49) became progressively weaker and therapy was terminated on the eighth day.

RESULTS OF TREATMENT

Microfilaria counts were made before treatment and, in a number of cases, immediately after treatment. There was no reduction in microfilaria level in these cases, but no reduction had been anticipated since a report[3] indicates that arsenamide has little or no effect upon the microfilaria. These workers report that as much as a year may elapse before the microfilaria disappear after the destruction of the adult worms. As yet, I have no adequate data on that phase of the subject.

The results are shown in detail in table 1 and summarized in table 2. The asymptomatic dogs (S-0) remained unchanged, but the S-1 and S-2 groups showed marked improvement.

The animals which were classified on admission as being in critical condition due to heartworms (S-3) were not good risks. It will be seen (table 1) that only 2 of the 7 responded to therapy with evidence of improvement. With 1 of these dogs (20), it was nearly a year before the heart murmur disappeared; another (dog 22) seemed to be improved but died four months later. Of the other 5 in this group,

3 died two, eight, and twenty-nine days after treatment, respectively. Two developed chronic ascites and were destroyed.

It appears likely in all 6 cases that the fatal termination was due to the long sustained effects of the heartworm infection, perhaps complicated by the destruction of the adult worms, with resulting damage to the lungs. There is no evidence that the drug *per se* had any deleterious effect upon the dogs.

POSTMORTEM FINDINGS

Necropsies were performed on 5 dogs which died or were destroyed. The results are as follows:

Dog 6 died twenty-nine days after completion of full course of treatment—no worms in heart or lungs.

Dog 7 was destroyed two months after completion of full course of treatment—no worms in heart or lungs.

Dog 5 was destroyed seven weeks after completion of full course of treatment—4 dead worms in heart, many fragments in pulmonary artery.

Dog 22 died four months after incomplete course of treatment—34 living worms in heart, extensive vegetative growths in right atrium, both valves thickened; heart enlarged; portal circulation seemed normal. This dog was in such poor shape that the full course of treatment could not be given (table 1).

Dog 2 was destroyed one year after treatment. One sluggish female worm was found in the heart, fragments of dead worms in the pulmonary artery, and the heart was enlarged. The portal vein was occluded 1 to 2 in. from the liver, and there were numerous anastomoses providing collateral circulation. The ascites in this case was apparently due to the occlusion of the portal vein. The occlusion was an old, well-established process with much granulation tissue, permitting a limited flow of blood. There was no evidence of either microfilaria or adult worms, but the process was so old that the exact cause of this formation could not be determined. It was the type, however, which could have developed as a result of chronic, passive congestion. Secondary to this occlusion of the portal vein was a central necrosis of the liver.

USE OF FUADIN FOLLOWING TREATMENT WITH ARSENAMIDE

Arsenamide destroys only the adult heartworms and, since microfilaria may continue to live in the bloodstream of the dog for years afterward, it can readily be seen that this would confuse or prevent a diagnosis of reinfection at a later date. Hence, it is desirable to dispose of the microfilaria, if this can be done without injuring the dog.

Fuadin was used for this purpose on several dogs in this series. An average of four intravenous injections was necessary before the blood became negative, that is, free of microfilaria. It was thought advisable to allow a lapse of several weeks after treatment with arsenamide before using fuadin, since both of these drugs are heavy metals and, if used together, might cause considerable damage to the liver and other organs.

TABLE 2—Summary of Results of the Treatment of Heartworm-Infected Dogs with Arsenamide

Group	Condition improved	No change	Died or destroyed	Unreported	Total
S-0	....	20	1	....	21
S-1	7	....	....	1	8
S-2	12	....	....	2	14
S-3	1	....	6	....	7
Total	20	20	7	3	50

DISCUSSION

Since many of the dogs treated did not suffer any clinical manifestation from the infection, no demonstrable improvement would be anticipated in such a group. However, if the adult worms had been killed, it seems likely that the development of symptoms may have been prevented.

The real measure of improvement would seem to have been obtained with the dogs in groups S-1 and S-2, 19 of the 22 showing long-term improvement, and the other 3 being unreported. Thus, none of them are known to be without improvement. The critically ill dogs are poor risks. There seems to be very little chance of bringing about improvement in such animals by the destruction of the adult worms and, conversely, there seems to be a very good chance of losing the animal. It would appear that long-standing infection may produce irreversible changes in the circulation or internal organs, and that the destruction of the adult worms may increase the danger to the animal. This possibility is suggested by the changes in the heart and tricuspid valves in 1 dog and the portal circulation in another.

The postmortem examinations revealed living worms in number in only 1 dog, which had not received the entire course of treatment. Another, killed a year after treatment, still harbored 1 worm. Of the remaining 3 dogs examined postmortem, 1 had only dead worms and the other 2 none. Whether these latter were without adult

worms at the time of treatment, or whether the worms had been killed, is a point for speculation. It is possible that worms killed during treatment had been largely or completely absorbed by the time these dogs were examined postmortem, one and two months after treatment. On the other hand, untreated dogs in this area are occasionally seen with many microfilaria but no adult worms. It is obvious that more data are needed.

Arsenamide, then, appears to be well tolerated and to produce clinical improvement in all heartworm cases except those which are already in critical condition when presented for treatment.

SUMMARY

1) Fifty dogs of varying ages and breed, and in varying stages of heartworm infection, were treated with arsenamide (T.D.C. #970).

2) The drug was well tolerated by the dogs in the doses used. Thirty-seven showed no symptoms at all during treatment, 11 developed a transitory cough, and 2 developed a temporary stiffness of the legs. No deaths were attributed to the effects of the drug.

3) Twenty-one dogs were asymptomatic; therefore, no change could be noted following treatment. Eight showed slight symptoms of heartworm infection and, of these, 7 improved and 1 remained unreported. Fourteen were dogs with typical heartworm symptoms and, of these, 12 improved and 2 remained unreported. Seven were dogs in critical condition previous to treatment and, of these, 6 died and 1 improved.

4) Postmortem examinations were made on 5 of the dogs which had died or were destroyed. Of these, 2 contained no worms, 1 contained dead worms. One dog was destroyed a year after treatment and this animal contained 1 live worm; the other dog, which did not receive the entire treatment, contained a large number of live worms.

5) The microfilaria are not killed by arsenamide, but an average of 4 intravenous injections of fuadin was sufficient to destroy the microfilaria in the dogs treated with it subsequent to treatment with arsenamide. This dose did not injure the patients.

6) It would appear that effective treatment of long-standing infection cannot be readily anticipated even though the adult worms are killed, but, if the infection is treated fairly early, particularly with young dogs, the results are promising.

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DDT Poisoning in a Cow

A mature, grade Guernsey cow, reported sick for four or five hours, appeared to have symptoms of a receding allergic reaction, with some edema of the thin-skinned portions of the body, some lacrimation, and slightly accelerated respiration. The cow was treated symptomatically and the case dismissed from mind.

Five days later the owner called, stating that the cow had become progressively worse. Examination revealed symptoms not unlike those reported for hyperkeratosis. The coat was rough, dry, harsh, and staring. The skin of the neck was wrinkled and seemed thickened. The eyes were swollen and watery, with encrusted margins. The skin of the muzzle was of red-brown, leathery texture, as were the teats and the hairless areas of the perineum. Her gait revealed slight incoördination, and there was a nervous, audible dyspnea, partly at least due to the encrusted nostrils.

She was stanchioned and 20 cc. of pyribenzamine was slowly given intravenously. Respiratory relief was immediate and the muscular coördination improved. Tablets containing 50 mg. of pyribenzamine were

left with the owner to be given at the rate of 10 orally, twice daily.

The owner reported improvement without interruption. Treatment was discontinued after four days.

Six days later, the cow was observed reclining and chewing her cud. The leathery epithelium of muzzle and teats had peeled away for the most part, leaving healthy normal tissue. The hair looked much better and the skin of the neck was nearly normal.

There had been no change in diet or pasture. The cow and herd were free of warbles. But the herd is located in an orchard area where considerable spraying is done at that time of year. DDT has been widely used as a spray material in recent years, and has already been suggested as the cause of symptoms similar to those reported for hyperkeratosis.[1]—*L. M. Koger, D.V.M., Ontario, Ore.*

[1]Biskind, M. S.: DDT Poisoning and X Disease in Cattle. J.A.V.M.A., *114*, (1949):20.

Brucellosis can be eradicated from a commercial swine unit by disposing of all the pigs on the farm and starting a new unit on clean ground.—*L. M. Hutchings, D.V.M., Indiana.*

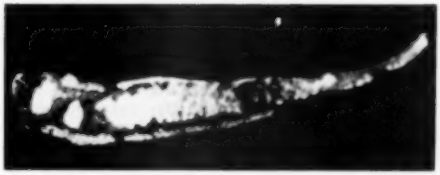
Liver Flukes from a Cat

Dr. David M. Bandy, Temple, Texas, submitted portions of a liver and several flukes from a cat, with a request that the flukes be identified. The history of the animal was as follows:

The cat was a family pet, born on the place, and had stayed in the house most of the time. It was noticed to be sick about two weeks before being brought to the hospital. During the last two days, it was breathing hard and "turning yellow." Examination at the hospital disclosed a marked dyspnea and severe jaundice. All visible tissues were yellow. The condition was tentatively diagnosed as an obstructive jaundice and a grave prognosis was given. The cat lived only a short time and autopsy revealed the icteric condition was due to a gross infection of liver flukes.

Specimens of these flukes, submitted to the Zoölogical Division of the U. S. Bureau of Animal Industry, were identified as *Amphimerus pseudofelineus* (Ward 1901). Dr. W. E. Price, assistant chief, Zoölogical Division, informs us that no previous record of this parasite has been reported from Texas, although it has been reported from cats and coyotes from Nebraska and has been found in cats from Panama. Four of the specimens were stained, mounted, and retained as U.S. National Museum Helminth Collection No. 46384, for the record.

The family Opistorchiidae, to which this particular fluke belongs, consists of small to medium size flukes, usually with a much



Liver fluke, Amphimerus pseudofelineus.

flattened and translucent body which is narrow anteriorly. In those instances where known, the life cycle requires a snail as an intermediate host, and the metacercariae encyst in the subcutaneous tissues of certain fresh-water fish. Infection occurs through eating raw infected fish. A small creek runs near the home of the owner of the cat and is a possible source of fish. However, several other cats on the place have shown no signs of infection.

Report is made of finding the liver fluke *Amphimerus pseudofelineus* (Ward 1901) in a naturally infected cat.—*R. D. Turk, D.V.M., M.S., Department of Veterinary Parasitology, School of Veterinary Medicine, A. & M. College of Texas, College Station, Texas.*

Leiomyosarcoma in a Dog

An 11-year-old male Setter was presented for examination. The history consisted solely of anorexia and listlessness for the preceding twenty-four hours. Abdominal palpation revealed a dropsical condition and a large swelling in the region of the right kidney. A tentative diagnosis of a cystic kidney was made; the abdomen then was tapped with a 16-gauge needle, and specific treatment withheld pending further examination.

Approximately six hours later, the animal died. Postmortem examination revealed a 5-lb. neoplasm enveloping and infiltrating the right kidney, infiltration of the left kidney, several walnut-sized lesions on the spleen and liver, and extensive pinpoint lesions on the abdominal surface of the diaphragm and throughout the lungs.

Tuberculosis was suspected and specimens were submitted for tissue examination. The diagnosis made by a pathologist was leiomyosarcoma, anaplastic form.—*Morton L. Sall, D.V.M., Portsmouth, Ohio.*

Low protein intake for gestating swine may result in abortion.

Immunity Status of Normal, Vaccinated, and Rabid Animals

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THE OBJECT of the work described in this report was to investigate the immune status to rabies of normal, vaccinated, and rabid animals, as determined by complement-fixation and virus-neutralization tests. It was also proposed to investigate concurrently the prophylactic value of rabies vaccine when administered subsequent to a virus exposure.

During the period July 1, 1946, to June 30, 1948, approximately 100 dogs were diagnosed clinically, by smear and/or by animal inoculation as positive for rabies, at the Third Medical General Laboratory, Manila, P. I. Approximately half of these animals were owned by army personnel; the remainder were strays. It was apparent that the disease was occurring only in young dogs. Army personnel newly arrived in the Philippines ordinarily obtain young puppies as pets, and the disease observed in these animals could, therefore, be expected to attack young dogs primarily. However, the disease occurring in stray dogs also appeared to attack only young animals. This age selection may have been due to the fact that there was a preponderance of young, stray animals, or it may have been due, in part, to chance. The subject was discussed with Dr. Pedro Villa, city veterinarian for Manila. He had observed 1,400 naturally occurring cases of rabies at the Manila City Pound. These observations had convinced him that rabies is primarily a disease of young dogs. The two separate observations mentioned raised the question as to whether an immunity to the disease is developed in dogs.

A rabies diagnostic antigen was obtained for use in trials in complement-fixation tests for diagnosis of rabies. This antigen was also to be used in tests to determine whether complement-fixing substances could be demonstrated in serum from normal, nonvaccinated animals. After considerable work had demonstrated the complement-fixing antigens to be ineffective, it was decided to employ virus-neutralization tests to detect the presence of protective substances in the serum of normal, vaccinated, and rabid animals.

In addition to the above, it was decided to conduct a few trials to see whether dogs could be used as experimental animals in evaluating rabies vaccine treatment when administered subsequent to a virus exposure. Thus, such animals could be utilized in all of the studies mentioned.

Attempts at evaluation of rabies vaccine treatment in human beings by epidemiologic means is somewhat inconclusive. First of all, a true attack rate is difficult to obtain. Analysis of data collected from different sources is stated by Johnson[1] to show a variation in attack rate of from almost 0 to 65 per cent of those exposed. There is never a control, nontreated group of persons to compare with a treated group. However, a great deal of material has been collected on the subject regardless of whether it could be used in a proper analysis of treatment value. Although such vaccine treatment has been universally employed and its value generally accepted, many authorities question its efficiency.

Denison and Dowling[2] reported on human rabies in Birmingham, Ala., covering a period of seventeen years (1922 to 1939). Of 42,947 persons bitten by dogs proved rabid, and subsequently given rabies vaccine therapy, 23 judged to have received prompt and adequate treatment died of the disease. No similarly exposed, nonvaccinated group was available for comparison, so Denison and Dowling attacked the subject from a different angle. The data they studied were collected in 1938. Negroes constituted 40 per cent of the population, yet they submitted only 12.5 per cent of the animals that were diagnosed as rabid that year. Negroes were known to have about as many dogs as the white population; hence it was probable that a majority of the Negroes bitten by rabid animals were unaware of the exposure and failed to report for antirabies treatment. The colored population of Birmingham, reported by Denison and Dowling, presented only 10 per cent of the dogs submitted for vaccination during a drive for control of the disease in animals. Rabies vaccination

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This work was done in the Veterinary Department, Third Medical General Laboratory, Manila, P. I. It was authorized by Col. Harvey R. Livesay, M.C., commanding officer of the Laboratory, who made many helpful suggestions.

of unexposed dogs has been proved an effective preventive measure;[3] therefore, it is reasonable that the incidence of rabies in dogs owned by the colored people was greater than in dogs owned by the noncolored people. From this assumption, one might expect that Negroes were more frequently exposed to rabies than the noncolored population. From this data, the authors presented a hypothesis that the colored population of Birmingham who were bitten by rabid dogs were less frequently treated with antirabies vaccine than the noncolored population; yet, fatalities due to rabies during this period were no greater among the colored than among the noncolored group.

Theoretically, the administration of rabies vaccine subsequent to a virus exposure has been given with the hope of inducing an immune state before the virus establishes itself within vital centers or the central nervous system. Kligler and Bernkopf[4] and Habel[5] present data to show that rabies virus injected peripherally or intraperitoneally invaded the central nervous system of laboratory animals within one to three days. The question is, therefore, raised as to whether sufficient circulating or cellular immunity can be developed by vaccine treatment before the virus has invaded and established itself in the central nervous tissue. Once the virus is established in the cells of the central nervous system, it is unlikely that circulating antibodies alone could ward off the disease.

Leach and Johnson[6] list the incubation period of rabies in experimentally infected dogs as averaging nineteen and four-tenths days. Hagan[6] states the incubation period of rabies virus in dogs is seldom shorter than twenty-one days nor longer than forty-two days. This incubation period is shorter than that listed for man (mean, 56 days[7]). This longer incubation period may contribute to the success of rabies vaccine treatment in man over and above that which might be seen in artificially infected, vaccine-treated animals.

METHODS AND MATERIALS

Two rabies antigens were used in complement-fixation tests on serum obtained from nonvaccinated, vaccinated, and rabid animals. One antigen was prepared by Cox[8] (director, Viral and Rickettsial Research Department, Lederle Laboratories). The other antigen was prepared at the Third Medical General Laboratory, using the procedure of Bernkopf and Nachtigal.[9] The latter was prepared from mouse brains infected with rabies virus. These were minced, desiccated over sulfuric acid for twenty-four hours, finely ground, and enough physiologic saline solution added to make a 2 per cent suspension. This was centrifuged, and the supernatant was used as the antigen.

For the complement-fixation test, the technique of Kolmer[10] was followed, except that two exact units of complement were used. Serum inactivation at 65 C. for twenty minutes was selected as most satisfactory for dog serum. The test was read thirty minutes after the hemolytic system was added.

In the neutralization tests reported in this paper, a strain of fixed rabies, mouse-adapted virus was obtained from the Virus Laboratory, Institute of Hygiene, Republic of the Philippines. Laboratory-bred white mice, 18 to 30 days old, were used in the tests. Rabbit serum, negative for rabies virus-neutralizing substances, was used in making virus dilutions and as control serum in the actual tests. Fresh mouse-passage brains were emulsified and suspended in 10 per cent rabbit serum saline solution for use in making virus dilutions. The test consisted of mixing equal parts of a test serum with different virus dilutions. These were incubated in a water bath to allow any possible neutralization of the virus, and stored under refrigeration until inoculated. Mice were anesthetized with ether and inoculated intracerebrally with 0.03 cc. of the solution. The highest dilutions were inoculated first, down to the lowest. Four mice were used for each dilution. Deaths during the first four days were attributed to trauma. Mice were observed for twenty days. The $l.d._{50}$ was computed by the method of Reed and Muench.[11] The neutralization index was determined as the antilogarithm of the difference between the $l.d._{50}$ for the control and the $l.d._{50}$ of the test serum. In detail, the methods used were as outlined for neutralization tests by Simmons and Gentzkow.[12]

Many of the serum specimens from normal, nonvaccinated animals used in the complement-fixation and neutralization tests reported were taken from stray, unclaimed mongrel dogs at the Manila City Pound. Present conditions would suggest it improbable that many of these unclaimed strays were ever vaccinated against rabies. Serum was also obtained for tests from owned, nonvaccinated and vaccinated dogs.

Brain tissue was obtained periodically from naturally occuring rabies cases for use in producing experimental rabies in dogs. This tissue was preserved in neutral glycerin and stored for short periods at -5 C. Any tissue stored more than fifteen days was discarded.

Leach and Johnson[13] have shown an attack rate in dogs of approximately 60 per cent following inoculation of a 10 per cent suspension of infective virus brain tissue from a rabid dog. The dosage they used was 0.5 cc. inoculated into each masseter muscle. In the work described herein, preliminary trials had to be conducted to determine the dosage required to produce a suitable attack rate. It was found that a dosage of 0.75 cc. of a 10 per cent infective brain tissue suspension was required as an injection into the right and the left masseter muscles to produce an attack rate (in young dogs) of 50 per cent or more. When titrated by intra-

cerebral mouse inoculation, using 0.03 cc. of the material in serial tenfold dilutions, it was determined to have a mouse $l.d._{50}$ of 10^{-4}. The total dosage of 1.5 cc. was equivalent to 500,000 mouse units.

RESULTS AND DISCUSSION

A major objective in the use of the complement-fixation test was to see whether it could be used as a rapid laboratory diagnostic test for canine rabies. The rabies complement-fixation antigen prepared at the third Medical General Laboratory was used in duplicate tests with the Cox antigen. The former antigen was reported to give positive complement-fixation results when tested against serum obtained from immunized rabbits, mice, and guinea pigs.[9] As a result of preliminary trials, it was determined that dog serum tested with these antigens was frequently anticomplementary. Any anticomplementary serum was treated by the method of Sachs[10] in retests to circumvent these reactions. This treatment did not alter expected results of positive immune or negative nonimmune, rabbit-serum control specimens. No attempt is offered to explain why dog serum should have reacted in this manner. It is emphasized that rabbit and even human serums were tested as a check on procedures and they did not show this marked anticomplementary activity.

TABLE 1—Results of Complement-Fixation Tests of Dog Serums Obtained from Nonvaccinated, Vaccinated, Virus-Exposed, and Rabid Animals

Specimens (No.)	Ave. age (years)	Animals from which serum was taken	Test results pos.	neg.
60	1½	Nonvaccinated	2	58
10	3	Vaccinated 30-60 days*	3	7
15	1	Normal dogs, serum taken 35 days after inoculation of 10% infected brain tissue.	1	14
15	1	Clinical rabies cases	0	15

*Commercial vaccine used (phenol killed, 20% brain suspension). Three doses were given at seven-day intervals. Amounts of 2, 3, and 5 cc., respectively, were used for animals weighing 20 to 35 lb.

In the complement-fixation tests reported in table 1, serum obtained from fasted animals was tested within four days of the time it was drawn. The antigen prepared by Cox was used in all of the complement-fixation tests. The antigen prepared at the third Medical General Laboratory was used on about 75 per cent of the specimens in duplicate tests. The duplicate tests indicated that one antigen was no more specific than the other. Hence, only data obtained on tests using the Cox antigen are recorded in table 1.

Since both antigens failed to give specific tests on dog serum, the antigen prepared at the Third Medical General Laboratory was used in check tests on human serum. Two specimens of serum from nonvaccinated human beings were tested using the routine procedure. They were also tested following treatment by Sachs' method. The two specimens were negative in both tests. Two specimens of serum from persons who had completed fourteen daily injections of antirabies vaccine (within 45 days) were also tested. Both specimens were positive using the routine procedure as well as when treated by Sachs' method. It is believed these data imply that the antigens used were made nonspecific by some factor present in dog serum that is not present in human, rabbit, guinea pig, or mouse serum. It is not intended to

TABLE 2—Results of Rabies Virus Neutralization Tests of Serum Obtained From Nonvaccinated and Vaccinated* Dogs

Animals total No.	Age groups (years)	Status of animals from which serum was taken	Neutralization test data: Range of titer	Percentages
29	½—6	Nonvaccinated	0-50	57% of age group
10	½—6	Nonvaccinated	50-100	20% of age group
9	½—6	Nonvaccinated	100-500	18% of age group
3	½—6	Nonvaccinated	1000+**	6% of age group
1	2	Vaccinated 13 mo. past	68	.....
1	2	Vaccinated 10 mo. past	15	.....
1	3	Vaccinated 7 mo. past	100	.....
1	2	Vaccinated 1 mo. past	749	.....
1	4	Vaccinated 6 mo. past	1000+	.....
5	2-3	Vaccinated 3 mo. past	1000+	.....

*Commercial vaccine used (phenol killed, 20% brain suspension). Three doses given at seven-day intervals. Amounts of 2, 3, and 5 cc., respectively, were given to animals weighing between 20 to 35 lb.

**A plus sign (+) signifies an unknown end point but one greater than is indicated.

imply that complement-fixation tests for rabies in dogs would be nonspecific if some other antigen or technique were used.

Another objective in the use of the complement-fixation tests reported in table 1 was to study the immune status of normal, rabies-vaccinated, and rabid animals. Since the complement-fixation tests appeared to lack specificity, it was decided to use serum virus-neutralization tests in an effort to accomplish this objective. The results of this work are recorded in tables 2 and 3.

Table 2 records neutralization test data obtained from 51 nonvaccinated and from 10 vaccinated animals. Examination of the data obtained from the nonvaccinated animals indicates approximately 45 per cent of the animals tested had considerable protective substances in their serums (an index of 50 or more). It is generally believed that specific neutralizing substances may develop in animals as a result of exposure to many pathogenic viruses in cases where no clinical symptoms of disease subsequently develop. If the data were interpreted in this manner, it would then suggest that these animals have had an experience with rabies virus. A comparison of the neutralization indexes obtained between the young animals and the older animals tested did not imply any immunity gained with age.

It is interesting to note the neutralization index obtained from vaccinated animals in table 2. Animals vaccinated within six months showed an index of over 1,000. A sharp drop in neutralizing substances was seen in animals vaccinated seven, ten, and thirteen months before the test serum was drawn. This is interpreted as evidence that a strong immunity was not maintained in the vaccinated animals for longer than six months.

There were two major objectives in the work recorded in table 3. First, it was proposed to investigate the prophylactic value of rabies vaccine when administered subsequent to a virus exposure. Second, it was intended to use the material offered by these animals, and serum from them

TABLE 3—Neutralization Test Data of Serum Obtained from Stray Mongrels: Preinfection, Rabid, and Virus Failure Cases

Animal (No.)	Virus Inoculum data: Route	Amt. 10% susp.* Injected each side	Observation days: Neg.	Pos. 1st sympton	Neutralization test index**: pre-infection	symptoms	virus failures
3	MM	1.0 cc.	....	16	36	1000+	.....
6	MM	1.0 cc.	....	17	356+	.....	.....
13	MM	1.0 cc.	....	18	56	.....	.....
1	MM	1.0 cc.	42	....	16	.....	169
2	MM	1.0 cc.	42	....	36	.....	274
4	MM	1.0 cc.	42	....	30	.....	590+
5	MM	1.0 cc.	42	....	16	.....	127
7	MM	1.0 cc.	42	....	28	.....	274
8	MM	1.0 cc.	42	....	165	.....	127
9	MM	1.0 cc.	42	....	61	.....	867+
10	MM	1.0 cc.	42	....	35	.....	76
11	MM	1.0 cc.	42	....	165	.....	166
12	MM	1.0 cc.	42	....	8	.....	75
14	MM	1.0 cc.	42	....	52	.....	169
15	GM	1.0 cc.	....	22	77	.....	.....
18	GM	1.0 cc.	....	16	36	681+	.....
23	GM	1.0 cc.	....	22	24	.....	.....
26	GM	1.0 cc.	....	16	10	1000+	.....
27	GM	1.0 cc.	....	20	52	.....	.....
16	GM	1.0 cc.	42	....	9	.....	590+
17	GM	1.0 cc.	42	....	36	.....	87
19	GM	1.0 cc.	42	....	52	.....	590+
20	GM	1.0 cc.	42	....	11	.....	76
21	GM	1.0 cc.	42	....	11	.....	39
22	GM	1.0 cc.	42	....	77	.....	127
24	GM	1.0 cc.	42	....	165	.....	290+
25	GM	1.0 cc.	42	....	37	.....	127
28	GM	1.0 cc.	42	....	35	.....	274

MM = masseter muscle; GM = Gastrocnemius muscle.

*Total dosage of 2 cc. of a 10% infected brain saline suspension was given ($1.d._{50}$ 10^{-4}.152 or 946,700 mouse units).

**Preinfection = Serum drawn 3 days before virus inoculation. Symptoms = Serum drawn at height of rabies symptoms. Virus failures = Serum drawn 42 days after virus inoculation from animals not showing symptoms.

+Signifies unknown end point, but one greater than indicated.

was taken for neutralization tests to complete the investigation of rabies antigenic responses in normal, rabies-vaccinated, and rabid animals that are reported in table 2.

The mean incubation period of rabies in man was stated as forty to sixty days, while that in dogs was approximately twenty to forty days. It was believed this longer incubation period in man might contribute to the success of rabies vaccine treatment over and above that seen in artificially infected animals. Consequently, it was thought the incubation period in experimental animals might be altered by selection of the route of inoculation.

Examination of table 3 reveals that 3 of 14 animals (21%) inoculated in muscles of the face were attacked. The incubation period varied from sixteen to eighteen days (inoculation time until the first typical diagnostic symptom was seen), and the average was seventeen days. Of animals inoculated in the hind leg, 5 of 14 (36%) were attacked. The incubation period was from sixteen to twenty-two days to the first observable symptom, and the average was nineteen days. As a result of this work, it was concluded that the site of inoculation did not significantly influence the attack rate nor the incubation period of the virus in producing disease. Since an incubation period equivalent to that seen in man was not produced, it was decided to delay continuation of this phase of the work pending completion of trials to determine the speed with which antigenic responses are stimulated in vaccinated dogs.

It is believed that neutralization indexes in the range listed under the preinfection column in table 3 do not indicate solid immunity. In fact, one serum specimen (No. 6), showing an index of 356+, was taken from an animal that developed rabies following the virus exposure. Other specimens showing an index of less than 50 were taken from animals that did not develop rabies following the virus challenge. None of the preinfection specimens tested showed a neutralization index anywhere near levels found in specimens obtained from recently vaccinated dogs (table 2). Therefore, one could not expect any of these animals to possess a solid immunity to the infective dose of virus given. Serum taken from animals 3, 18, and 26 during the time symptoms of the disease were evident showed neutralization indexes of 681+ to 1,000 or more. The great rise in titer observed during the course of the disease adds evidence to the efficiency of the test in detecting specific protective substances for rabies.

It is interesting to examine the 20 cases classified as virus failures in table 3. There was an appreciable rise in neutralizing titer in 16 of 20 (80%) of the cases. It is believed that this is strong evidence that an animal may be exposed to rabies virus and not develop symptoms, yet receive an antigenic response from the exposure.

Since the incubation period for rabies reported in table 3 averaged nineteen days, it was decided not to conduct trials in which virus-infected dogs were to be treated with daily injections of rabies vaccine. It was doubted whether sufficient antigenic response could be developed to ward off the disease, by vaccine treatment, within the time offered by a nineteen-day incubation period. It was thought that the speed of antigenic response to vaccine treatment should first be determined in dogs. To determine whether an antigenic response to rabies vaccine could be demonstrated within nineteen days, serum was obtained from 7 dogs before, and periodically following, the first injection of vaccine. The test animals received 14 daily injections of the vaccine antigen.

Examination of table 4 and graph 1 reveals relatively low neutralization indexes

TABLE 4—The Rapidity of Virus Neutralization Changes in Serum of Dogs Treated Daily With Rabies Vaccine*

Animal (No.)	Age (yr.)	Neutralization index data and status of vaccine treatment: 1 day before injection	4th day after 1st injection	9th day after 1st injection	14th day after 1st injection	21st day after 1st injection	26th day after 1st injection	31st day after 1st injection
1	1	130	40	191	164	900	31,630	21,550
2	1	6	11	131	316	1,000	4,640	6,810
3	1	19	34	89	1,780	3,163	17,000	10,000
4	1	3	13	1,138	858	1,000	31,630	10,000
5	1	130	19	341	100	1,000	21,550	46,400
6**	1	3	11	61	100	10	436	2,155
7	1½	19	3	141	8,580	5,736	31,630	10,000
Average indexes		44	19	299	1,699	1,830	19,787	15,273

*Given 1.5 cc. of vaccine on 1st and 2nd day followed by 0.5 cc. per day for 12 subsequent injections. Phenolized vaccine of commercial brand used (20% caprine brain suspension).

**Animal sick with distemper from 14th to 30th day.

for serum taken from animals up to the fourteenth day after the first vaccine injection when the neutralization indexes had risen to an average of approximately 1,700. The average titer rose to nearly 20,000 on the twenty-sixth day.

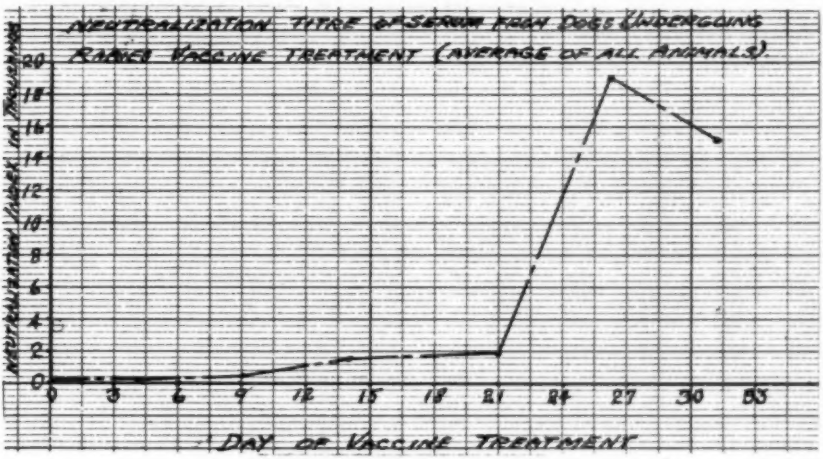
The average incubation periods shown in experimentally produced canine rabies were only seventeen and nineteen days to the first observable symptoms in the two groups of animals used. In order to demonstrate the effectiveness of vaccine treatment, one would not expect favorable results unless considerable immunity were developed during the early period of the incubation of the virus. The neutralization test data reported above suggest considerable immune substances had developed in dogs within fourteen days of the time vaccine injections were initiated. However, the greatest response was evident after twenty-one days, which is two days longer than the incubation period observed in experimental infection. It is questionable whether the antigenic response demonstrated within fourteen days of the first vaccine injection would be sufficient to ward off terminal infection in an animal treated after a virus exposure. Unfortunately, the incubation period of the disease in the dog was quite short to consider it an ideal animal to use in tests of the effectiveness of rabies-vaccine treatment when given subsequent to a virus exposure. However, the antigenic response that did occur may justify the use of sufficient animals to determine whether effect of such vaccine treatment could be demonstrated in dogs. Completion of this work has been delayed, but it may be continued when conditions permit.

SUMMARY

Two separate rabies antigens were used in complement-fixation tests. Expected results were obtained in tests with positive and negative rabbit and human serum specimens. It was, therefore, expected that the test would prove an effective means for rapid diagnosis of canine rabies, and that it could be used in a survey of the rabies immune status of vaccinated and nonvaccinated dogs. Tests of the antigens with dog serum frequently gave anticomplementary reactions, and they did not give expected results with serum from nonvaccinated, vaccinated, or rabid animals.

Serum virus neutralization tests were used in an effort to determine the rabies immune status of nonvaccinated and rabies-vaccinated dogs. A high percentage of nonvaccinated animals showed high neutralization indexes. This suggests an accidental experience with rabies virus without ever having developed typical disease. Neutralization tests of serum from 7 of 10 vaccinated dogs showed a high titer for all animals given vaccine within six months of the time the specimens were drawn. Three of the specimens gave a low neutralization index. They were obtained from dogs vaccinated seven, ten, and thirteen months prior to the time the serum was drawn for test.

An attempt was made to investigate the prophylactic value of rabies vaccine when administered subsequent to a virus exposure. The incubation period of the disease in man is longer than that ordinarily seen in dogs. It was thought this fact might contribute to the success of vaccine treatment over and above that seen in



virus-exposed dogs. In an effort to extend the incubation period of experimental rabies in dogs, two series of animals were exposed; one by inoculation of virus into the masseter muscles of the face and another by inoculation of virus into the gastrocnemius muscles of the legs. An average incubation period of seventeen days (to the first observable symptom) was observed in animals inoculated in muscles of the face; whereas an average of nineteen days elapsed in animals inoculated via the muscles of the leg.

Since an incubation period equivalent to that seen in man was not produced, it was decided to delay these trials pending determination of the speed with which antigenic responses are stimulated in vaccinated dogs. Seven animals were given 14 daily injections of vaccine. Blood was periodically taken for neutralization tests. A marked antigenic response occurred between the ninth and fourteenth days after the first vaccine injections. However, greatest response occurred between the twenty-first and twenty-sixth days. These antigenic responses suggest a possibility of demonstrating effectiveness of vaccine treatment in dogs when used subsequent to a virus exposure.

There was a rather consistent and strong rise in virus-neutralization titers in serum from animals exposed to rabies virus that did not subsequently manifest symptoms of the disease. The results suggest that animals may be exposed to rabies virus under natural conditions and fail to develop clinical disease, but that they may receive a certain amount of immunity as a result of the virus exposure.

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Hydrocyanic Acid Linked to Bloat

A possibly important link in the hazy pathogenesis of ruminant bloat is the hydrocyanic acid content of some pasture plants, especially legumes. Cyanogenic glucosides produce this acid by hydrolysis with enzymes and the acid, in turn, causes relaxation and then paralysis of the smooth muscle of the rumen.

Evans and Evans, of Wales (*Nature,* 163, March 5, 1949), found that 1 liter of clover juice—which is the equivalent of about 5 lb. of fresh clover—introduced directly into the rumen of a sheep paralyzed its movements immediately. Natural feeding trials with cattle on white clover pasture were less conclusive, with only 1 of 3 animals bloating after a short grazing period that followed twelve hours of fasting.

The Welsh investigators do not offer the acid-paralysis theory as a blanket explanation of bloat, but they urge that it be considered along with other known or suspected factors in the complex bloat syndrome. In this category are the poisonous gases (carbon monoxide, hydrogen sulfide) that accumulate in relatively large volume when legumes are consumed, the foaming property of certain constituents of plant life (saponin), and contributory pasture conditions and feeding practices.

Brucellosis Eradication.—Test and slaughter in a herd passing through a storm of abortions—where the owner is forced to buy replacements—is not brucellosis eradication. It is not sound economically nor professionally. Test and slaughter in a herd having no other sanitary or management program is a prohibitively costly plan of eradication. But test and slaughter, properly supplemented with vaccination, with sanitary precautions against introducing infection, and with intelligent application of our knowledge of the disease, is still the final step in every brucellosis-eradication program.

One of the best starting feeds for baby pigs is rolled oats.

Rabies in Illinois

L. R. DAVENPORT, D.V.M.
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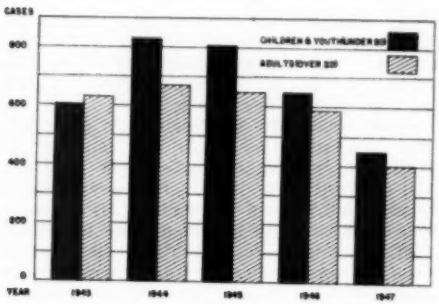
A STUDY of the dog-bite incidence in Illinois over a five-year period, from 1943 through 1947, presents some disturbing public health and economic aspects. As shown by the accompanying charts, it has been found (chart 1) that more than half of the bite wounds inflicted occurred among children and adolescents. Approximately 70 per cent of the bite wounds were inflicted on the face, neck, shoulders, arms, and hands (chart 2), areas within the "danger zone," so-called because of the proximity and nervous accessibility of these areas to the central nervous system.

In studying this phase of the dog-bite incidence, it is shocking to note the severe physical damage done, especially among children where severe exposure to rabies and other infection has resulted from extensive multiple wounds about the head, neck, shoulders, and upper extremities. Many wounds have been deep lacerations about the face, requiring surgical repair with a great possibility of permanent disfiguration, even if the victim succeeded in avoiding rabies or other infection.

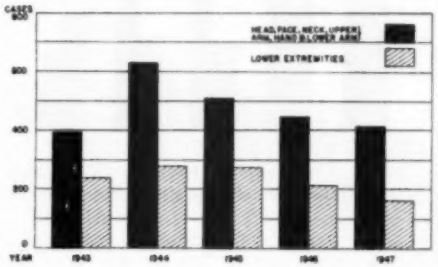


—*Illinois Department of Public Health*

Chart 1—Age distribution of dog-bite wounds inflicted, 1943-1947.

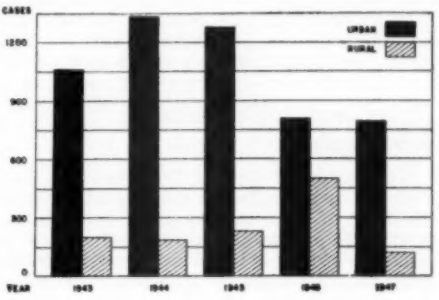
As shown in chart 3, by far the greater number of dog bites occurred in urban areas, which is to be expected due to the concentration and close contact of the dog and human populations. Yet, in cities and towns where official and public awareness of the rabies hazard should be most acute, and where veterinary facilities are most abundant and accessible, it is disturbing to note that many dogs inflicting bite wounds were destroyed immediately after biting without observation or examination.

On the other hand, chart 4 reveals that of the total number of dogs observed after inflicting bite wounds, more than 70 per cent were found to be rabid by laboratory examination. Upon this basis, we might theorize that more than 70 per cent of the dogs not examined were rabid, thus greatly increasing the total number of rabid animals. While, with a theoretical 30 per cent negative unexamined dogs, a corresponding number of persons were forced to suffer unnecessarily the expense and inconvenience of antirabic treatments. It is fitting to point out the severe anxiety suffered by persons bitten by dogs in which actual



—*Illinois Department of Public Health*

Chart 2—Distribution of dog-bite wounds, 1943-1947.



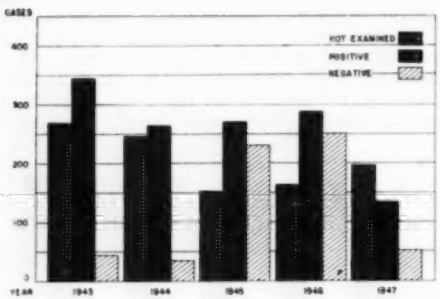
—*Illinois Department of Public Health*

Chart 3—Distribution of dog bites, urban and rural 1943-1947.

Consultant in veterinary medicine, Division of Communicable Diseases, Illinois Department of Public Health.

rabies infection must always remain a matter of conjecture.

Perhaps the most significant aspect of the failure to investigate the presence of rabies infection in dogs is that any attempt to evaluate the rabies hazard in a locality or in the state is defeated — the public security being left strictly to the mercy of uninformed, indifferent attitudes and the



—*Illinois Department of Public Health*

Chart 4—Observation of dogs after biting, 1943-1947.

dogs. Not shown graphically is a range of human exposure to rabies by dog bite wherein more than 30 persons have been bitten by a single dog, not to mention the matter of contact which always presents the possibility of infection from virus-laden saliva.

From the economic standpoint, it is estimated that the people of Illinois have spent in excess of $100,000 annually for antirabic treatments and other medical and surgical care, plus the anxiety and the inconvenience suffered, plus the danger of possible untoward sequelae attending the administration of vaccine treatments. Rabies is computed to have cost the livestock industry of the state approximately $500,000 annually in the loss of animals and animal products, resulting in large degree from the bites of roving rabid dogs.

Blood and Sulfadiazine in Brucellosis

In the experimental treatment of brucellosis in animals, we have used blood at the rate of 2 cc. per pound of body weight and sulfadiazine at the rate of 1 Gm. in each 100 cc. of blood. With the larger animals, the amount of blood may be reduced somewhat. We have used 1,000 cc. of blood from a nonreacting cow and 10 Gm. of sulfadiazine in a few experimental cows. Two injections are given at twelve-hour intervals and sulfadiazine is administered orally for five to seven days. No conclusions can be drawn from our results to date.—*I. Forest Huddleson, D. V. M., Michigan.*

Rabies Control

Rabies has been epidemic and epizoötic in central New York State since 1944.—*H. C. Ostertag, New York.* . . . Four hurdles must be surmounted to obtain an accurate picture of the incidence of fox rabies: (1) The fox must be seen; (2) the person who sees it must recognize rabies symptoms; (3) the person must report the animal to the health officer; and (4) the animal's head must be sent to a laboratory for examination.—*Alexander Zeissig, New York.*

In feline cases of rabies, where no Negri bodies were found, the disease was still established after two blind passages in white mice. In these cases, the disease did not appear until twenty-eight and twenty-nine days after inoculation, instead of the usual twenty-one.—*J. H. Steele, Georgia.*

A compulsory vaccination program, alone, would not be effective in controlling rabies. A uniform coöperative plan is essential.—*J. S. McDaniel, New Jersey.* . . . In New York State, dog control has become secondary to vaccination as a control measure. When 70 per cent of the dogs are immunized under this program, the quarantine is lifted—but unvaccinated dogs must remain restricted. Dog rabies has essentially disappeared from the State. —*R. F. Korns, New York.* . . . The articulate opposition to a rabies-control program usually stems from misunderstanding of the problem.—*H. C. Ostertag.*

Control procedures can take two directions: dog control and dog vaccination. New York relies on mass vaccination. Rabies is primarily a bite-transmitted disease, and contact with saliva without a bite offers only a remote contingency. A rabies advisory council should consist of representatives of the board of supervisors, health officials, police, dog wardens, dog owners, farm organizations, and sportsmen. Such a board must conduct an educational program, because unless 70 to 90 per cent of the people of the area are convinced of the wisdom of the program, the dogs will not be brought in for vaccination. Four measures are necessary to an effective rabies control program: (1) good dog management, (2) mass vaccination, (3)

Notes from the Interstate Conference on Rabies Control, New York, N. Y., Dec. 15, 1948.

active rabies advisory councils, and (4) a planned educational program. Compulsory vaccination programs may be depended upon to bring in only about 30 per cent of the dogs, and this alone is not enough to control rabies. Control measures alone are inadequate and ineffective, primarily because people *will not* keep their dogs penned up or tied for more than a few days.

In rabies in wildlife, professional trappers are used to reduce the fox population and to teach residents. By concerted effort, 75 to 80 per cent of the foxes in any sizeable area may be removed. The "take" usually amounts to 3 to 5 animals per square mile. Financing is important, and should be on a state basis. Bounties are not successful, because trappers will work only while foxes are plentiful and easy to catch. The annual fox take in New York, without bounty, is between 25 and 30 thousand.—*A. Zeissig.*

Rabies (since 1947) in farm animals appears to be declining: 47 cows died of rabies in 1944, 87 in 1945, 440 in 1946, 329 in 1947, and 210 in 1948 (to Dec. 1). Vaccination of farm dogs appears to be an important factor in this decline.—*E. V. Moore, New York.* . . . Rabies virus does not live outside the animal body, there are no known insect vectors, and transmission is by direct route only—usually by a bite. —*J. H. Steele.*

The conference adopted the following resolution:

WHEREAS, the problem of rabies control is an interstate problem already in the area of the states of New Jersey, Pennsylvania, and New York; and

WHEREAS, within each of these states it involves dog licensing and control, public health, domestic animal losses and indemnity, and wildlife conservation;

THEREFORE BE IT RESOLVED, that this interstate conference on rabies control recommends:

1) The establishment within each of the aforementioned states of a coördinating committee composed of the heads of the several departments having responsibility for these government functions; and

2) The establishment of a regional, interstate continuing committee composed of the appropriate legislative and administrative officials of each of these states and of others having an interst in this problem. The membership of such regional continuing committee shall be appointed by the chairman of the Conference on recommendation from the respective commissions on interstate cooperation. Such committee shall address itself to the following problems:

a) An effective and, if possible, uniform method of reporting the incidence of rabies;

b) To study the dog-licensing and control laws of the respective states with a view to improving the same;

c) To explore the effectiveness of control techniques with respect to dogs, domestic, and wild animals;

d) To develop and recommend to the appropriate state agencies educational programs designed to reach dog wardens, dog owners, game protectors, peace officers, etc;

e) To make such other recommendations as may be helpful in the eradication of this disease.

Avian Pneumoencephalitis Vaccination

The use of live virus vaccines for avian pneumoencephalitis on 150,000 pullets and laying hens in disease-free flocks, according to the University of Illinois College of Veterinary Medicine, resulted in:

1) Less than 1 out of 200 pullets died during a two-week period following immunization, and only 1 out of 400 became paralyzed.

2) In pullet flocks with less than 10 per cent production, vaccination caused little or no change in egg production, but in pullet flocks with more than 25 per cent production, there was an average decrease of 54 per cent, and laying did not return to normal for an average of twenty-seven days. Two flocks of old hens went completely out of production and into a molt.

The Common Oil Can.—As an applicator of fluids, the prosaic oil can has many uses in veterinary practice. One agrees with Dr. J. C. Gorman (*National Fur News*, Jan., 1948) that nothing is handier than a common oil can for treating ear mites in foxes. Easy squirting, driving but mild penetration, even distribution, mixing the fluid by shaking, and rapid administration to a number of animals consecutively are the advantages.

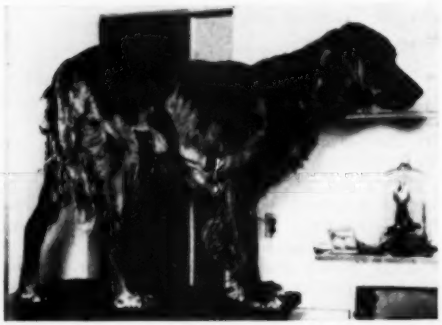
Animal and poultry remedies are being displayed prominently in most of our rural communities by hatcheries, drug, feed, and hardware stores, and more than likely will shortly be seen in our taverns and hamburger stands.—*Dr. J. M. Hurd before the Iowa V.M.A., Jan., 1948.*

Diabetes Mellitus in a Dog

S. POLLOCK, D.V.M., and E. O. BAUMAN, M.D.
South Orange, New Jersey

DIABETES mellitus, in a considerable number of human cases, appears possibly to result from true psychic shocks and severe emotional disturbances. Since depressive emotions, anxieties, fears, and unhappiness, arising from various causes, are notably capable of provoking the onset in man, it is interesting to consider the possible relation between the emotions and diabetes in the dog.

The patient, a 6-year-old female Irish Setter was apparently in good health until the owner boarded the animal for approxi-



The patient, when first admitted to the hospital.

mately five weeks at a private kennel. During this period, the dog lost much weight, ate sparingly, and appeared very nervous. After several weeks at home, despite the accustomed feeding, the animal continued to lose weight, drank enormous quantities of water, and voided constantly.

Physical examination revealed an apathetic, cachectic Setter weighing 30 lb.; pale membranes; temperature 102 F.; chest normal to auscultation and percussion; abdomen soft and no pain evinced on palpation.

LABORATORY FINDINGS

Urinalysis.—The urine was slightly cloudy, yellow, and acid. The specific gravity was 1.028; sugar 4 plus (++++); acetone 1 plus (+); diacetic acid negative; albumin 2 plus (++).

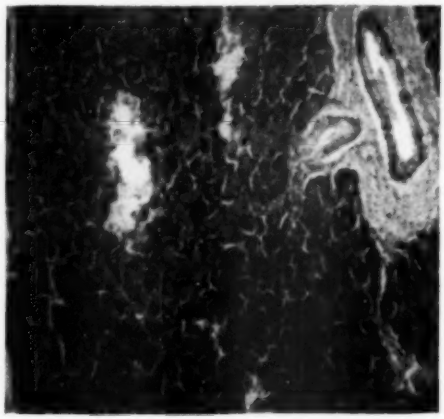
Microscopic Examination.—The urine was loaded with pus cells; three to five red blood cells per high power field; no casts were present.

Complete Blood Count.—Hemoglobin, 65 per cent (Tallquist); red cell count, 5,000,000; white cell count, 22,800; stab cells, 17 per cent; polymorphonuclears, 72 per cent; lymphocytes, 11 per cent. Red blood cells exhibited moderate achromia; wet smear was negative for *Dirofilaria immitis.*

Blood Chemistry.—Blood sugar, 40 mg. per 100 cc. of blood.

Stool Examination.—*Ancylostoma canium*, 4 plus (++++).

Upon the recommendation of Dr. E. O. Bauman,* the patient received 8 units of insulin plus 8 units of protamine zinc insulin in the morning, followed in twenty minutes by a diet consisting of cooked horse meat (1½ lb.) and cooked oatmeal (2 oz. dry weight). This ration was given in two feedings. The diet and insulin dosage were arrived at as an average maintenance after three or four days of treatment. Clinical improvement and moderately free specimens were the criteria used, rather than absolutely sugar-free specimens.



The pancreas showing lack of islet tissue.

On the fifth day, the urine became sugar-free, the classical symptoms disappeared, and the patient exhibited an interest in its new environment. Ten days later, anthelmintic medication was administered. Progress became rapid and her weight of 40

*Metabolic Service, Newark City Hospital, Newark, N. J.

lb. indicated she was ready for home convalescence.

The owner was instructed in the technique for administering insulin, plus the equipment to run daily sugar determinations. The enthusiasm, after a month, waned to a request for euthanasia, which was performed when the patient returned with the admission symptoms.

AUTOPSY FINDINGS*

Pancreas.—The gross weight was 65 Gm., obviously enlarged. In three microscopic sections, the islets were very sparse and when present consisted of only a few cells, some of which had pyknotic nuclei.

Adrenal.—No significant lesions were recognized.

Aorta.—No significant lesions were recognized.

Urinary Bladder.—There was some infiltration of the submucosa with plasma cells and lymphocytes.

Kidney.—The capsule was rough on the surface and quite thick. In sharply demarcated areas, the interstitial stroma was greatly thickened and infiltrated here and there with plasma cells and lymphocytes. The glomeruli were severely affected, having thick Bowman's capsules and showing hyaline changes to complete sclerosis. Some Bowman's capsules were thickened and dilated with resultant compression of the tufts. The convoluted tubules were often dilated and many contained albuminous casts. Part of the wall of the renal pelvis was intensely infiltrated with lymphocytes and plasma cells. In one area, there was an acute purulent inflammation involving all of the tubules and stroma. The blood vessels showed no significant changes.

Heart.—No significant lesions recognized.

Spleen.—There was considerable congestion and one area of lymphoid hyperplasia in the spleen.

Liver.—Most of the hepatic cells had a vacuolated cytoplasm, presumably due to the presence of glycogen.

Diagnoses.—(1) Pyelonephritis, acute and chronic, cause undetermined, canine; (2) hypertrophy of pancreas, cause unknown.

Terminal findings of pyelonephritis were not surprising and often form a difficult complication in the treatment of human diabetes. If euthanasia had not been requested, the complication probably would not have been insurmountable with the help of antibiotics and a more rigid diabetic regimen until the infection had cleared.

More careful observation and publicity in scientific circles should be given to these comparatively rare cases of spontaneous diabetes in dogs, as a source of invaluable experimental material, since all artificially induced diabetes in dogs probably lack the elements of the spontaneous disease. Attention should even be directed toward breeding these animals if possible.

*Courtesy of Army Institute of Pathology.

SUMMARY AND CONCLUSIONS

A case study of canine diabetes mellitus is described because of the:

1) psychic disturbances preceding the onset of symptoms;
2) classical laboratory findings;
3) insulin therapy employed;
4) histopathologic confirmation.

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Disease Control.—The spread of diseases can be effectively controlled only when the animals known to be infected can be properly identified and their movement restricted or halted. The infected animal continues to be the most important means of spreading disease.

Isotopes.—Long articles on isotopes, forecasting their usefulness in the practice of veterinary medicine in the future, do not signify that these radioactive elements are listed in the drug catalogues, accurately as they can be tagged and traced. Isotopes still belong to the field of scientific research.

The heifer calf, born twin with a bull, may be classified on the basis of a simple test. Insert the closed end of an ordinary 6-in. test tube into the vagina. If it can be inserted the full distance, the calf is probably a normal heifer. If only about half of the tube can be inserted, the calf is a freemartin.—*M. G. Fincher, D.V.M., New York.*

Objectives of Veterinary Medicine. — The objectives of veterinary medicine are to protect animal health and to increase livestock production, thereby protecting the health of human beings — not only from the diseases which may be transmitted from animals to man but also from all other ailments caused by a failure to consume adequate amounts of the protective foods of animal origin.—*James Farquharson, D.V.M., Colorado.*

Erysipelothrix Rhusiopathiae Infection in Fowl

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THE FIRST reported outbreak of *Erysipelothrix rhusiopathiae* infection in turkeys in the United States occurred at Annandale, N. J., in November, 1934. Since then, the disease has been reported from widely separated sections of the country, but not another outbreak was seen in New Jersey until November, 1945. This report deals with seven outbreaks encountered since then, six in turkeys and one in ducks. All were found in the course of routine diagnostic service. Time did not permit a thorough investigation of each outbreak. However, it seems well to place such cases on record so that the importance of the disease will not be minimized.

GEOGRAPHIC DISTRIBUTION OF PREVIOUSLY REPORTED CASES

New England. — Vermont, October, 1936[3] and 1940;[29] Massachusetts, south central, October, 1936;[3] Connecticut, November 1940, September, 1942, and October, 1942,[15] five outbreaks on separate farms during October and November, 1945.[17] No outbreaks reported in Maine, New Hampshire, and Rhode Island.

Middle Atlantic. — New Jersey, November, 1934;[1] Eastern New York, November, 1936;[2] others at Trumansburg, November, 1939; Cohocton, November, 1940; Lima, October, 1941; Webster, November and December, 1941; and Orange County, October, 1942.[12] During 1946, eight outbreaks in turkeys diagnosed with recurrence on the same farm in three successive years, the last time in December;[28] Pennsylvania, one outbreak.[22]

East North Central. — Illinois, an outbreak in ducks in March, 1932;[6] Michigan, Lake City, October, 1945, and Ewen, October, 1946;[21] Ohio, Indiana, and Wisconsin have not recorded the disease in birds.

West North Central. — Minnesota, November, 1938;[9] Iowa, in quail, 1939,[7] date and location of an outbreak in pheasants reported diagnosed by Morgan is not given;[7] Nebraska, in chickens, Loup City, October, 1942;[16] no reports from North or South Dakota or Kansas.

South Atlantic. — No reports.

East South Central. — No reports.

West South Central. — No reports.

Mountain. — Utah, in turkeys, Fairview, November, 1936;[3] Colorado, in turkeys, Colorado Springs, September, 1946;[26] no reports from Montana, Idaho, Wyoming, New Mexico, Arizona, or Nevada.

Pacific — California, Gerber, November, 1937;[4] the Report of the Los Angeles County Live Stock Department for 1942[29] mentions diagnosis of the disease, that for 1943[30] refers to an outbreak on a farm where it occurred the previous year, and the report for 1946[31] reports the diagnosis of five outbreaks but does not give the location of these; Oregon, two outbreaks in October and a third in November, 1937,[8] one in March, 1939;[9] a later report records five outbreaks in 1938, and eight in 1939;[10] western Washington, five outbreaks during the three years prior to 1942.[11] In 1 case, the disease appeared on the same farm three successive years — February, 1939, November, 1940, and October, 1941. A later report records eight outbreaks from November through February for the three years prior to 1943.[13]

BACTERIOLOGY

Cultures were taken from the liver and grown on a plain nutrient agar plate. After twenty-four hours' incubation at 37 C., subcultures were made in nutrient broth for the purpose of inoculating fermentation tubes.

All cultures isolated fermented dextrose and lactose without gas formation. Maltose and sucrose were not attacked. Stab cultures in nutrient gelatin at room temperature gave the characteristic test-tube brush growth.

CASES

***Case* 1.—This flock of 34 birds, about ready for the market, was near Cranbury, N. J. They were kept in a wire-floored shelter about 3 ft. off the ground. On the morning of Nov. 2, 1945, 3 toms were found dead. They were opened by the owner, their livers removed, and brought to the Experiment Station. On examination, they were found to be enlarged and 1 showed a bronze discoloration.**

Cultures revealed the presence of an organism with the growth and staining characteristics of *Ery. rhusiopathiae*.

A visit was made to the farm on November 28, at which time it was learned that the remaining 31 birds had been killed, dressed immediately, and placed in a fro-

Paper of the journal series, New Jersey Agricultural Experiment Station, Rutgers University — The State University of New Jersey, Department of Poultry Husbandry.

The assistance of Dr. F. R. Beaudette in the preparation of this paper is greatly appreciated.

zen-food locker. After the pen was cleaned and disinfected, 10 half-grown turkeys were placed in it; so far, none has been affected. In pens about 10 ft. away, 1 goose, 6 ducks, 12 pigeons, and about 100 chickens were kept. There had been no losses among these. Other stock in the vicinity included a horse stabled a few feet to the rear of the turkeys and a herd of about 50 goats across the road. Although there was no fence, the goats never crossed the road. Sanitary conditions on the farm were very poor.

Case 2.—On Aug. 13, 1946, 4 ducklings (3 dead and 1 alive) were presented for examination from a farm near Robbinsville, N. J. The dead ones showed enlarged, yellowish livers and enlarged spleens that were almost black. No hemorrhages were observed in any of the birds. The live specimen had watery eyes and was blind in both eyes. Cultures revealed the presence of *Ery. rhusiopathiae* infection in the 3 dead specimens.

A visit was made to the farm on August 14. It was found that about 100 ducklings, out of 250, had been lost. Losses were said to have begun when the birds were 4 weeks old. All had been hatched by a flock of a dozen or more Muscovies. The young consisted of recently hatched ducklings to half-grown birds. There had been no losses among the adults. No dead ducklings were found, but a few cripples were seen. Fish offal from mackerel obtained from a fish market had been fed to the ducks on several occasions. In this connection, it is to be recalled that Klauder *et al.*[26] have described fish handlers from which the swine erysipelas organism was isolated. The report is of special interest since it particularly involved fishermen off the New Jersey coast. Another interesting, and perhaps significant, statement, with reference to the present case, is that most of the human cases occurred during the hot months. This coincides with the duck case which, occurring in August, is distinctly out of season with respect to the usual fall incidence of the disease in birds.

Since fish have been incriminated as a source of human infection, Beaudette[27] suggested that it might be well to avoid feeding products of the sea which have not been sufficiently heated to kill the organism. Later, Grenci[28] actually isolated the organism from fish meal, which is a common ingredient of turkey mash.

The only other animals on the place were 50 pullets which were kept penned. These had no direct contact with the ducks which had the run of the farm. Sanitary conditions were poor, with weeds 3 to 4 ft. high and many holes in the ground where water could collect.

Case 3.—On Oct. 11, 1946, a single bird was received from a flock of 600 turkeys near Newtown, Pa. On examination, the bird showed enlargement of the liver and spleen. No hemorrhages were seen in the muscles. A culture from the liver revealed the presence of *Ery. rhusiopathiae*.

The flock was divided into three wire-floored pens separated by wire partitions. Losses were confined to an end pen where 2 males died on October 10, 2 on October 11, and 1 on October 12. There were no further losses up to October 26, when the owner was last consulted. This is a large, general farm; besides turkeys, there were also cattle, hogs, sheep, chickens, and ducks. Aside from the usual mortality in chickens, none of the animals has been, or is, sick. The pigs are kept near the turkeys, and the ducks travel from the pig pen to feed around and under the turkey pens. Pigeons have been seen feeding with the turkeys and traveling to a pig pen about a mile away on another farm. According to the owner of the turkeys, pigs on the neighboring farm were affected with swine erysipelas. No pigeons have been found dead on the owner's premises. It should be pointed out, however, that the absence of dead pigeons does not exclude this species as a possible carrier of the infection. As pointed out by Martel in a comment on a paper by Urbain,[25] pigeons feeding on swine excrement around a slaughterhouse were found highly resistent to inoculation, presumably resulting from an immunity built up through infection taken in *per os*.

Case 4.—Three turkeys were presented for examination from a flock in Morristown, N. J., on Oct. 17, 1946. Two were males and 1 a female. One male showed hemorrhages in the muscles, and all showed enlargement of the liver and hemorrhages in the spleen. *Ery. rhusiopathiae* was isolated from 1 male and 1 female. Losses began on October 10, and 8 toms and 4 females had died.

The flock was kept in wire-floored cages, well off the ground, in a single row, and about 4 ft. apart. There were seven pens with about 70 birds in each. The outbreak occurred in an end pen. No losses were experienced in any of the others. After the owner was informed of the identity of the disease, and the fact that males were more susceptible, the males were slaughtered and placed in cold storage. According to the owner, 3 of them were listless and, when dressed, showed bluish areas in the skin. A request to examine 1 of these was refused. Up to November 7, no losses occurred among the hens left in the pen or

among hens added to the pen a week or more previously. The only other animals on the premises were pigeons and chickens. There have been no unusual losses among these. Some goats had been pastured in the area where the turkey pens are located, but these were removed two months before the outbreak.

Case 5.—On Oct. 21, 1946, 1 turkey was presented for examination from a farm on the outskirts of Hightstown, N. J. The bird was brought in by the owner's brother, who, unfortunately, knew nothing of the history of the case, except that 9 birds had died in the preceding days. Examination of the specimen revealed hemorrhages in the muscles and spleen, and enlargement of the liver. A culture from the liver indicated *Ery. rhusiopathiae* infection.

It was not possible to visit the farm until December 11. The flock had consisted of 600 birds divided among seven wire-floored shelters, six of which were in a row with the seventh at right angles on one end. A wire partition divided the pens. They were on sloping ground, so that pen 1 was about 6 ft. off the ground and pens 6 and 7 about 3 ft. The outbreak began in pen 1, with a loss of 8 males, and apparently spread to pen 2, where 4 males were lost. All birds in the affected pens were sold at Thanksgiving time. On December 11, about 200 birds, most of which were males, were left in the 5 shelters.

The turkeys were the only livestock on the farm. Though at one time the owner thought he detected pigeon droppings on some of the feed bags, pigeons were never seen around the premises. Other free-flying birds were seen.

Case 6.—Two turkeys from a flock of 400 in Milltown, N. J., were presented for examination on Oct. 28, 1946. The specimens showed hemorrhages in the muscles, enlarged livers with small necrotic foci, and extensive hemorrhages in the spleen. Cultures showed the presence of *Ery. rhusiopathiae* infection.

The flock was in a single, wire-floored shelter and, therefore, the birds were in direct contact with one another. The outbreak began on October 27 and lasted twelve days with a loss of 120 birds. Of these, 117 were males and 3 females.

There were no other animals on the premises. Pigeons and other free-flying birds were often seen around the shelter.

Case 7.—This flock was near Jamesburg, N. J. Losses began Nov. 5, 1946, and 1 bird was lost each day for the next five days. On November 9, 2 male turkeys were submitted for examination. One was in good flesh but showed hemorrhages in the muscles and in the spleen and an enlarged liver. The other was thin, and had blackhead lesions in the liver and spleen and hemorrhages in the muscles and spleen. Cultures showed *Ery. rhusiopathiae* in both birds. This information was given to the owner on November 11 by phone. The following day, all the remaining turkeys were slaughtered and placed in a frozen-food locker.

The flock had consisted of 115 males and females kept in a single, wire-floored shelter. The losses were confined to the male birds. Besides turkeys, there were also chickens, cattle, horses, and hogs on the place. The hogs were examined by the state veterinarian, and no evidence of swine eryispelas was found. Pigeons were constantly seen around the premises.

DISCUSSION AND SUMMARY

Seven outbreaks of *Erysipelothrix rhusiopathiae* have been described, six in turkeys and one in ducklings. The source of the infection was not determined. The outbreak in ducklings may have followed the practice of feeding fish offal. The only animal common to the turkey outbreaks was the pigeon and, in 1 case, contact was inferred simply from pigeon droppings found on the feed bags. In a second instance, pigeons had been seen feeding with the turkeys. Mice are known to be highly susceptible, and the organism has, on two occasions, been isolated from the wild rat. These animals are found on most farms and could easily invade wired-in shelters. It seems, therefore, they should be given consideration as possible vectors of the disease.

In all cases, the turkeys were kept in wire-floored shelters. That the disease is not very contagious from shelter to shelter seems to be borne out by the fact that a very short distance between shelters or even a wire partition within the same shelter is sufficient to prevent rapid or serious spread. Thus, in the one case where a large number of birds were in direct contact with one another, the loss was very heavy; whereas, in those cases where the number of birds per unit was small and there was some degree of separation, the losses were comparatively small.

As in most other reported outbreaks in turkeys, the disease occurred in the fall, *i.e.*, 4 cases in October and 2 in November; the case in ducklings occurred in August. It is to be noted, however, that the latter had been fed fish offal. Also, males showed a high degree of susceptibility as compared with females. In the six outbreaks, 150 males and 7 females were lost.

It may be of some epizoötiologic significance that five of these outbreaks took place in the adjoining counties of Middlesex and Mercer in communities no more than 10 miles apart, a sixth a few miles accross the Delaware River from Mercer County, and a seventh in nearby Morris County.

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Notes on Brucellosis

The cow infected with brucellosis is not profitable; a good dairy cow may be conservatively estimated to produce 2,000 lb. less milk after she becomes infected. Figure it out on the present price of milk. . . . Cows may be infected for two hundred days before agglutinins appear in the blood, although the usual incubation period is much shorter. . . . Veterinarians in Michigan have used almost 60,000 doses of M vaccine in about 5,000 herds. . . . Many of these herds had been brucellosis-free for a number of years and were in the early stages of reinfection when vaccinated. . . . Results will be reported at the AVMA convention in Detroit (July 11-14). . . . Experimentally, M vaccine protects against *Brucella abortus, Brucella suis, and Brucella melitensis* infections.—*From a talk by I. Forest Huddleson before the Northern Illinois VMA.*

Streptococci were found in the milk of 40 per cent of 7,751 cows from 458 herds surveyed for mastitis. The incidence of streptococci in the milk increased from 23.9 to 85.7 per cent from the first to the twelfth lactation. This increase in relation to the number of lactations followed a curved, rather than a straight line, regression.—*J. O. Alberts, D.V.M., and H. S. Bryan, D.V.M., Illinois.*

Veterinary Vital Statistics.*—Reliable information on morbidity and mortality of farm animals can only be compiled when the practicing veterinarians file prompt reports with the proper officials. Here, as elsewhere, the practitioner must live up to state requirements—he cannot be permitted to make his own regulations.—G. W. *Jensen, D.V.M., Illinois.

Symposium on the Use of Sulfonamides for Control of Poultry Diseases

At the San Francisco Session of the Association, the Section on Poultry conducted a symposium on the use of sulfonamides for control of poultry diseases. The members of the panel were Dr. J. P. Delaplane, Kingston, R. I., Moderator; Dr. E. M. Dickinson, Corvallis, Ore.; and Dr. C. A. Brandly, Madison, Wis. The *following is a condensation of the remarks of the symposium participants.*

The Role of the Sulfonamides in the Prevention and Control of the Respiratory Diseases of Chickens

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In the United States, there are two respiratory diseases of chickens recognized as being of bacterial origin: infectious coryza, due to the organism *Hemophilus gallinarum;* and the respiratory form of fowl cholera caused by the organism *Pasteurella avicida.* Since the sulfonamides are known to be of no value against virus infections, this discussion will be confined to these two diseases.

Infectious Coryza

The organism *H. gallinarum* was first described by de Blieck[1] in Holland, later by Nelson,[2] Delaplane *et al.*,[3] Eliot and Lewis,[4] and Schalm and Beach[5] in the United States.

The disease is characterized, in chickens, by a coryza, which does not have an offensive odor. Frequently, there is swelling of the face and wattles. The swelling of the face is caused by edema of the tissues, rather than bulging of the chambers from accumulations of exudate in them. Occasionally, there is extension of the infection to the lower respiratory tract, resulting in symptoms of tracheitis and bronchitis. In the latter form, it is difficult to distinguish from other respiratory infections such as infectious bronchitis or Newcastle disease (avian pneumoencephalitis).

A definite diagnosis can be established only by using blood, or other suitable medium, to isolate the organism. Pure cultures of the organisms may be isolated from the edematous swellings of the wattles or face if of recent development. On the other hand, if the swellings result from fowl cholera, *P. avicida* will be isolated.

Infectious coryza and the respiratory type of fowl cholera are both referred to as "coryza" by many workers, with the implication that the organism *H. gallinarum* is most often the causative agent. The author doubts the wide prevalence of infectious coryza (*H. gallinarum* infection) in the United States as compared with the wider prevalence of localized fowl cholera, particularly in farm flocks.

The Respiratory Form of Fowl Cholera

The respiratory form of fowl cholera is also characterized by a coryza but, unlike infectious coryza, the former has a characteristic, offensive odor. At any given time, from 5 to 15 per cent of the birds show swelling of the face and wattles. The facial swelling in fowl cholera results from accumulations of caseous exudate in the nasal chambers and sinuses rather than from edema of the tissues, as in infectious coryza. Caseous exudate may extend into the lacrimal ducts and eyes. This is the disease condition which poultrymen ordinarily refer to as "roup." Lower respiratory involvements, simulating symptoms of other respiratory diseases, commonly occur. In some outbreaks, joint involvements affecting individual birds are observed.

In most flock outbreaks, the rate of spread of infection is rather slow, and it requires several months for the birds to recover. A definite diagnosis can be established only by isolating the causative organism, *P. avicida.*

Fortunately, both infectious coryza and the respiratory form of fowl cholera are easily eradicated from a poultry farm by complete segregation of the young replacement birds from the old flock. Using a sulfonamide for disease prevention or treatment should be considered a make-shift arrangement to cushion the losses until eradication by management practices can be effected.

Sulfathiazole was first reported to be effective against the organism *H. gallinarum* by Delaplane and Stuart[6] who observed that quantities of 0.5 and 0.25 Gm./30 Gm. of feed, or 3.33, 1.66, and 0.83 per cent, prevented symptoms of coryza after chickens

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had been inoculated with virulent cultures of the organism.

The medicated feed also hastened the recovery of infected birds. It was observed that after the medicated feed was discontinued, the inoculated birds developed the disease; the infection had merely been retarded sufficiently to prevent clinical symptoms.

Work of Schlenker *et al.*[7] indicated that sulfathiazole blood levels of from 1.6 to 2.4 mg. 100 cc. were desirable in preventing or overcoming infection. Wernicoff and Goldhaft[8] reported the use of sulfathiazole in field outbreaks of infectious coryza and found the drug valuable in preventing and treating the disease.

Sulfathiazole was found of no value[9] in preventing the respiratory form of fowl cholera. Further studies[10] confirmed the ineffectiveness of sulfathiazole against this infection.

To the author's knowledge, no evaluations of the newer sulfonamides, *i.e.*, sulfamerazine, sulfamethazine, and sulfaquinoxaline, have been reported against infectious coryza. Conceivably, any of these compounds would be more satisfactory than sulfathiazole.

Sulfathiazole can be used to advantage in outbreaks of infectious coryza, but the method of use would have to be based on each particular flock situation. The drug is also an aid, where laboratory facilities are lacking, in distinguishing between infectious coryza and the respiratory form of fowl cholera. Infectious coryza responds to sulfathiazole medication; fowl cholera does not.

In the author's opinion, diseases such as infectious bronchitis, of a rather limited period of infection and duration, have been mistakenly called "coryza" and treated with sulfonamides. After recovery, credit has been given to the drug rather than to the fact the birds would have recovered in a similar length of time without the treatment. This is one of the abuses which, unfortunately, cannot be avoided in applying any worth-while therapeutic agent.

SULFONAMIDE COMPOUNDS

In 1945, Delaplane,[10] after using a number of the sulfonamide compounds to combat the respiratory form of fowl cholera, found all of them valueless except for turkeys. Sulfathiazole, sulfanilamide, sulfapyridine, and sulfadiazine were among those studied. Sulfamerazine, when given in sufficient quantities to produce toxic symptoms, helped prevent infection. The work with sulfamerazine encouraged the idea that chemotherapy might offer a possibility in the control and prevention of the infection.

Later, it was observed that sulfaquinoxaline, given in the feed at the rate of 0.1 and 0.05 per cent, was valuable in preventing the infection but was of questionable use in hastening the recovery of birds already affected. In six experimental groups of birds, 32 of 35 (91%) inoculated, untreated controls developed infection which was severe in most cases. In six experimental groups given sufaquinoxaline at the rate of 0.1 per cent, 5 out of 65 birds (7.6%) developed mild symptoms of infection. In three groups given the drug at the rate of 0.05 per cent, 1 out of 28 birds (3.5%) developed mild symptoms of disease. Seven additional experimental groups were studied with similar results (unpublished). Later, Delaplane and Milliff[11] observed symptoms and lesions of sulfaquinoxaline toxicity in laying birds given 0.05 per cent of sulfaquinoxaline in the mash continuously. Further work (unpublished) has shown that 0.05 per cent of sulfaquinoxaline fed intermittently can be given laying birds without difficulty. Recent studies have indicated that by reducing the concentration of the drug to 0.033 per cent in the feed, it can be given continuously, prevents infection under experimental conditions, and does not interfere with egg production or hatchability.

Under laboratory conditions, inoculated birds which have been given sulfaquinoxaline develop symptoms of the disease when medication is discontinued. Thus, it would appear that to prevent infection under field conditions, the drug would have to be used continuously.

Delaplane and Higgins[12] reported observations on the use of 0.033 per cent sulfaquinoxaline in the feed for the prevention and control of the disease in one flock under field conditions. The incidence, spread, and severity of infection was less in the medicated birds than in the untreated controls. The medicated group of chickens weighed an average of 0.6 lb. more per bird and there were fewer culls than in the control lot.

Limited studies (unpublished) using 0.3 and 0.5 per cent of sulfamethazine in the feed indicate that it, too, has value in preventing symptoms of infection in birds inoculated with *P. avicida*.

Further studies will be necessary to evaluate these drugs properly for use under field conditions.

SUMMARY

The sulfonamide compounds are of value

only in the two respiratory infections of chickens caused by bacteria.

Sulfathiazole is of value in preventing infection and hastening the recovery of chickens inoculated with the organism, *Hemophilus gallinarum*, but it is useless against the respiratory form of fowl cholera.

It is conceivable that other, newer sulfonamide compounds would be more effective than sulfathiazole in the prevention and control of infectious coryza, but no report of their use has appeared in the literature.

Sulfaquinoxaline and sulfamethazine are effective in preventing the respiratory form of *Pasteurella avicida*, but are probably of questionable value in overcoming infection already established.

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Whole wheat, cracked or coarsely ground, has about the same feeding value, pound for pound, as shelled corn for beef cattle.

Sulfonamides in the Control of Protozoan Infections in Poultry

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In the consideration of a symposium on sulfonamides that are effective against protozoan parasites of poultry, one soon finds that the preponderance of available data deals with the effect of various sulfonamides on the common cecal coccidia of the chicken, *Eimeria tenella*. Since Levine,[1] in 1939, first reported on trials with sulfanilamide and prophesied "It is not beyond the realm of possibility that some derivatives of sulfanilamide may be developed which will have the same coccidiostatic action as sulfanilamide but with less toxicity for the host," there has been a great deal of data published and much work done with several different sulfonamide drugs. At present, four of the sulfonamides (sulfaguanidine, sulfamerazine, sulfamethazine, and sulfaquinoxaline) lead the list on which published data are available concerning the effect on Protozoa that infect poultry. The first three mentioned are now rather commonly used by specialized poultry producers for the control of cecal coccidiosis in chickens. In spite of this rather widespread use by poultry producers, there is need for much additional information on these drugs.

At present, critical tests on the effect of the sulfonamides on the different species of intestinal coccidia is urgently needed. Field trials are frequently misleading, because suitable controls under such conditions are often impossible to maintain. Certainly, reports from poultry producers who use one of the sulfonamides and then report no trouble from coccidiosis is of no value in a critical evaluation of the effect of treatment.

The method of administration varies widely in different localities. Likewise, the dosage used by different poultry producers frequently varies as much as 100 per cent. In this respect, there appears to be need for greater uniformity of recommendations. Perhaps additional, critical trials are needed to develop the most economical and effective methods of administration. For example, in our experience, we have had several poultry producers who have used sulfaguanidine as a prophylactic on an

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intermittent feeding schedule of one or two days each week during the latter weeks of the brooding period. They report acute outbreaks of the disease, often with as much loss as they usually had when no prophylactic effort was employed. Some preliminary trials on intermittent feeding with sulfaguanidine, under critical conditions, have given interesting results.

EXPERIMENTAL PROCEDURE

Three pens of New Hampshire chicks were reared under electric hovers, with shavings as litter and management precautions taken to prevent natural coccidial infections. At 21 days of age, pens 1 and 2 held 150 chicks each, and pen 3 held 145. At this time, special management precautions were no longer maintained, and the experiment started.

Chicks in pen 1 had 1 per cent of sulfaguanidine added to their all-mash rations two days a week for 7 weeks, starting when the chicks were 21 days old. The 150 chicks in pen 1 were wing-banded and 6 lots of 25 chicks each were designated by wing-band number. Each chick in lot 1, when 21 days old, was inoculated in the crop with about 100,000 sporulated *E. tenella* oöcysts. Chicks in lots 2, 3, 4, and 5 were inoculated in the same manner when they were, respectively, 22, 23, 24, and 25 days old. The 25 chicks in lot 6 were left as uninoculated controls. Table 1 shows the mortality in pen 1. When the remaining chicks were 72 days old, and the intermittent feeding of sulfaguanidine was discontinued, a challenge inoculation of about 100,000 sporulated *E. tenella* oöcysts was given to each chick.

The 150 chicks in pen 2 were wing-banded, and 6 lots of 25 chicks each were designated by wing-band number. Chicks in lot 1, when 21 days old, were inoculated in the crop with about 100,000 sporulated *E. tenella* oöcysts. Chicks in Lots 2, 3, 4, and 5 were inoculated in the same manner as lot 1 when they were, respectively, 22, 23, 24, and 25 days old. The chicks in pen 2 had 1 per cent sulfaguanidine added to their all-mash ration three days each week for 7 weeks, starting when the chicks were 25 days old. The 25 chicks in lot 6 were left as uninoculated controls. Table 2 shows the mortality in pen 2. The chicks remaining in pen 2, when 72 days old, were given a challenge

TABLE 1—One Per Cent of Sulfaguanidine in All-Mash Ration Forty-Eight Hours Each Week for Seven Weeks. Chicks 21 Days Old at Start (Pen 1)

Lot	All chicks in lots 1-5 inoculated with 100,000 *E. Tenella* as follows	Chicks (No.)	Mortality Days after inoculation 5	6	7	8	17	42	Challenge inoculation 51 days after 1st inoc. Chicks (No.)	Mortality
1	Same day drug put in mash.	25	0	16	3	2	0	0	4	0
2	24 hr. after drug put in mash.	25	2	16	0	0	0	1*	6	0
3	48 hr. after drug put in mash.	25	2	15	0	0	0	0	8	0
4	24 hr. after treated mash replaced with untreated mash.	25	1	19	1	0	0	0	4	0
5	48 hr. after treated mash replaced with untreated mash.	25	5	6	0	0	0	0	14	0
6	Uninoculated controls.	25	0	0	0	0	1**	0	24	0

*Ulcerative cecitis secondary to cecal coccidiosis. **Cecal coccidiosis due to natural infection.

TABLE 2—One Per Cent of Sulfaguanidine in All-Mash Ration 72 Hours Each Week For Seven Weeks. Chicks 21 Days Old at Start (Pen 2)

Lot	All chicks in lots 1-5 inoculated with 100,000 *E. Tenella* as follows	Chicks (No.)	Mortality Days after inoculation 5	6	7	8	9	20	22	Misc. Loss*	Challenge inoculation 51 days after 1st inoc. Chicks (No.)	Mortality
1	96 hr. before drug first put in mash.	25	4	15	0	0	0	0	0	0	6	1
2	72 hr. before drug first put in mash.	25	0	3	0	0	0	0	0	1	21	1
3	48 hr. before drug first put in mash.	25	1	1	0	0	0	0	0	0	23	0
4	24 hr. before drug first put in mash.	25	0	2	0	0	1	0	0	1	21	1
5	On same day drug first put in mash.	25	0	2	3	1	0	0	0	1	18	0
6	Uninoculated controls kept in same pen.	25	0	0	0	0	0	2**	1*	0	22	1

*Mortality due to diseases other than coccidiosis. **Cecal coccidiosis due to natural infection.

inoculation of about 100,000 sporulated *E. tenella* oöcysts.

The 145 chicks in pen 3 were wing-banded, and 6 lots of chicks were designated by wing-band numbers as follows: 24 chicks each in lots 1, 3, and 5; 25 chicks in lots 4 and 6; and 23 chicks in lot 2. These chicks were maintained as untreated, uninoculated controls. They were from the same source and were the same age as those in pens 1 and 2. They were always cared for after the chicks in pens 1 and 2, and no precautions were taken to prevent tracking coccidia from pens 1 and 2. When the chicks were 72 days old, they each received a challenge inoculation of about 100,000 sporulated *E. tenella* oöcysts similar to that given the chicks in pens 1 and 2. Table 3 gives the mortality for pen 3.

TABLE 3—Untreated, Uninoculated Controls in Separate Pen. Chicks 21 Days Old at Start (Pen 3)

Lot	Chicks (No.)	Mortality 49th day	72nd day Chicks (No.)	Mortality Days after challenge inoculation† 2	5	6	7	8	9	Total
1	24	1*	23	1*	0	1	0	0	0	2
2	23	0	23	0	1	0	0	1	0	2
3	24	0	24	0	0	1	2	0	0	3
4	25	0	25	0	0	1	0	1	0	2
5	24	0	24	1**	0	5	0	0	1	7
6	25	0	25	0	0	2	0	0	0	2

*Mortality due to Leucosis.
**Cecal coccidiosis due to natural infection.
†Challenge inoculation = 100,000 *E. tenella* oöcysts.

DISCUSSION

Pen 1 chicks, fed 1 per cent of sulfaguanidine in an all-mash ration two days each week for 7 weeks, were not protected against *Eimeria tenella* infection. Pen 2 chicks, fed 1 per cent sulfaguanidine in an all-mash ration three days each week for 7 weeks, did show a marked protection, except for lot 1 chicks that had been exposed to infection too long (96 hr.) before treatment was given. However, the protection was not complete, and some birds died from coccidiosis in the lots (2, 3, 4, and 5) that were artificially inoculated with a heavy dose of *E. tenella*. Chicks in lot 6 in both pens 1 and 2 did not pick up enough natural infection to cause any marked mortality. These chicks did pick up enough natural infection, however, to show a marked resistance to the challenge dosage given all chicks when they were 72 days old. Chicks in pen 3 received no treatment and were subjected only to natural infection that was tracked in from pens 1 and 2. Only 1 chick died from such natural infection. When chicks in pen 3 were given the challenge dose of *E. tenella*, the relatively light mortality in all lots, except lot 5, indicated that most of the chicks had acquired a marked resistance from the subclinical natural infections that they had picked up.

Wehr and Farr[2,3] have shown some interesting data on the delaying effect of sulfamethazine on the development of *E. tenella*. These data show a delay in the appearance of blood in the droppings, and oöcysts in the feces when treatment was discontinued five to eight days after inoculation with *E. tenella*. These investigators have also shown that the chief effect of sulfamethazine is against the second generation schizonts and merozoites and young gametocytes of *E. tenella*. Bankowski[1] reports a similar effect for sulfaguanidine. Since trials with sulfamerazine and sulfaquinoxaline show coccidiostatic effect when given seventy-two hours after artificial inoculation with *E. tenella*, but fail when given ninety-six hours after inoculation, it would apear that these sulfonamides affect the parasite during the same stages of development as sulfamethazine and sulfaguanidine.

The sulfonamides, fortunately, allow sufficient development of the parasites to produce a marked resistance or immunity, in most cases, against subsequent infections. Natural infections, however, can not be depended upon for a uniform amount of infection in all of the birds in a flock. Seeger[5] reports on a trial with sulfaguanidine and artificial inoculation with *E. tenella*. Johnson[6] had previously reported an attempt at artificial immunization, but a suitable procedure has not been developed. There is every reason to believe that the control of coccidiosis in poultry will ultimately yield to a method of artificial immunization. This may or may not be accomplished with the aid of the sulfonamides. It is sincerely hoped that investigations with these drugs as chemotherapeutic agents against coccidial infections of poultry will not draw attention away from research on the possibilities of handling the coccidiosis problem by artificial immunization.

No one doubts the coccidiostatic and coccidiocidal effect of the sulfonamides on the coccidia *E. tenella* when they are properly administered. One may, however, reasonably question the economy of the increasing erratic, promiscuous use of these drugs by the poultry industry.

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Septicemic Diseases Including Cholera and Salmonellosis

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The often spectacular reduction in losses during acute outbreaks of bacterial disease resulting from salmonella or cholera infections tends immediately to minimize possible limitations of the sulfonamides. Obviously, our whole approach and philosophy with regard to the control of infectious and parasitic disease has been somewhat modified. As a basis for a discussion which may be helpful in orienting the current situation and future prospects in the direction of the acute bacterial diseases of poultry, the following questions are offered:

1) How may reasonably satisfactory recognition of the limitations of sulfonamide therapy be achieved?

Admittedly, medicinal values are easier to sell, but of importance here is the tendency to overlook the fact that little or no benefit is derived after the short step is taken from acute to subacute or chronic disease. With immediate elimination of infection, ordinarily a desirable goal, the immunity response is abrogated. Additional emphasis must also be placed on the problem of toxicity of sulfonamides. Some discriminating poultrymen recognize the hazards of over-dosage and improper usage, but over-enthusiastic treatment must be recognized as causing considerable loss. Dr. R. A. Bankowski has stressed that, in most instances, we know little about the numerous variables that may be encountered in field use of sulfonamides, and thus, we must attempt a better evaluation and a more critical approach to sulfonamide medication among poultry flocks.

2) Can we anticipate that continuous treatment will be safe and harmless to the patient and to the food product which it represents?

It need not be repeated that continuous therapy will favor the development of resistant strains of the microbe or infection. An excellent example may be cited in the case of various military establishments during World War II. Continuous sulfonamide administration in "prophylactic" dosages necessitated closing of certain camps and posts because of inability to control subsequent serious infections by the sulfonamide-resistant bacterial pathogens which resulted. We cannot anticipate that poultry pathogens will be any less versatile and adaptable than those of man and other mammals.

Perhaps of lesser importance, but not to be overlooked in the present state of knowledge, is the possibility of sensitizing poultry, as well as other animals, to subsequent treatment or retreatment with these drugs. It is reported that man frequently becomes hypersensitive to various sulfonamide compounds. There are, then, to be considered the implications of the widespread use of these compounds in animals which make up an important part of the human diet. It, nevertheless, remains to be determined to what extent, if any, the consumption of poultry meat containing a considerable amount of sulfonamide compounds may affect persons who are sulfa-sensitive.

3) What may be done to further establish and maintain a satisfactory, long-range perspective of disease control based on a sound sanitary program?

Certainly, sulfonamides, used chiefly as emergency or stop-gap measures, have served a very useful purpose. We must, however, recognize and, to a certain extent, counter the tendency to rely too heavily on drug therapy. Preventive medicine, by circumventing contact of the parasite and the host, or at least reducing this contact in so far as possible, still must be stressed as an industry-wide and essential principal, lest it be neglected for more spectacular, often less laborious, but, obviously, not fully adequate long-range procedures. A continuous educational effort will certainly be required if we are to accomplish a sound approach to the problem.

Finally, there is the question of who should be responsible for the satisfactory evaluation of the sulfonamides before they are made available for field use. To date, various of the experiment stations have devoted much time and effort toward screening. If this is to continue — and we cannot anticipate that with development of drug-fastness a given sulfonamide may remain effective indefinitely — there should be established a critical set of standards, and a satisfactory method or system of such screening and testing, which will not

place an undue burden of time and effort upon certain agencies. By proper foresight and planning, certain difficulties can be avoided. The limitations, as well as the potential merits of any drug or combination of drugs should be determined before, not after, they have been released for use. In this way, considerable embarrassment and disappointment may be avoided.

Anaplasmosis Treatment with Acaprin

According to Udall,[1] it is doubtful if any medicinal treatment exerts a favorable action on the course of anaplasmosis. It is well known that many drugs have been tried with little or no affect. When the writer was in Egypt two years ago,[2] Dr. Zaki Mohamed reported the use of acaprin* with good results in treating anaplasmosis. Acaprin (Bayer 205) was first made about twenty-five years ago. It has been occasionally mentioned in literature as a specific treatment for piroplasmosis and babesiellosis. The writer was unable to obtain the drug until November, 1948. To date, acaprin has been used in treating 25 animals with anaplasmosis. Dr. A. M. McCapes, San Luis Obispo, Calif., a neighboring practitioner, treated 12 animals and the writer 13.

In each case, before acaprin was used, a blood film was stained with Wright's stain and examined under oil immersion to confirm the diagnosis. Some of the animals were in the early stages of the disease and some were moribund. The poorest results were naturally obtained in the animals nearest death. The treatment consisted of injecting 6 cc. of a 5 per cent acaprin solution subcutaneously. No other supportive treatment was given.

To describe the symptoms of all 25 animals would be too lengthy, so only 5 typical cases will be described.

Case 1.—An aged Durham cow exhibited anorexia and constipation; the temperature was normal. It did not respond to mineral oil and tartar emetic-nux vomica tablets in forty-eight hours. The blood sample was positive to Anaplasma and acaprin was given. Twenty-four hours later, the cow's appetite and bowels were normal.

Case 2.—Three dairy cows about 5 years of age, in the same dairy, with a history of lowered milk production and poor appetites, had temperatures from 103 to 106 F. Anaplasmosis was suspected, and blood samples were positive. Twenty-four hours after acaprin was given, their general improvement was marked. All 3 were normal in two to three days. One side reaction was noted in these cows: They practically dried up for one day but returned to full production in one week.

Case 3.—A 2-year-old, registered Hereford bull, which was anemic, had a temperature of 106 F. and was constipated and extremely reluctant to move. Appetite and bowels were normal twenty-four hours after acaprin was given. There was some elevation of temperature for several days. The patient was returned to breeding duty in a week.

Case 4.—This outbreak occurred in 2, 1-year-old Hereford range steers. Four had died over a period of one week, and 1 was almost moribund and died twenty-four hours after receiving acaprin. Several days later, 4 more steers exhibited symptoms and twenty-four hours after receiving acaprin, they could not be distinguished from well animals.

Case 5.—An aged dairy cow, with typical symptoms, appeared to be recovering rapidly after the administration of acaprin. She died three days later and no autopsy was performed.

SUMMARY

Of 25 animals treated with a single injection of 6 cc. of a 5 per cent solution of acaprin, after each was positively diagnosed as having anaplasmosis by microscopic examination of blood films, 21 made a prompt recovery and 4 died. A brief description of 11 animals has been given. From the results obtained thus far, acaprin seems to exert a favorable action on the course of the disease. The promising effect of the chemical, to date, would indicate that its possibilities should be further investigated. A thorough study should be made as to how and why it acts on the Anaplasma organism. Early recognitition of symptoms and confirmation by microscopic examination of the blood will bring the best results in treatment. Acaprin, which is administered subcutaneously, eliminates excessive restraint necessary in intravenous medication.—*Fred B. Pulling, D. V. M., Atascadero, Calif.*

*Acaprin, the trademark of Winthrop-Stearns, Inc., indicates its brand of 1,3-bis-(6quinolyl)-urea dimethylsulfate.

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Nebural (Winthrop) helps to stimulate appetite and control diarrhea in canine distemper.—*H. T. Cartrite, D.V.M., Texas.*

A Review of Histoplasmosis

JOSEPH S. RUHE, D.V.M., M.P.H. and PHILIP D. CAZIER, D.V.M.
Kansas City, Missouri

THE PURPOSE of this paper is to review, briefly, the reported cases of histoplasmosis in animals and to report our experience with experimental infection of dogs with *Histoplasma capsulatum*.

During the past decade, many important additions to our knowledge of histoplasmosis seem definitely to relate this infection to the daily work of the public health official and also to the problems of the practicing veterinarian. Histoplasmosis is an infection caused by the fungus *H. capsulatum*. This disease has been known in human beings since 1906,[1] and in animals since 1939.[2] In man, it was once considered uniformly fatal. However, a series of epidemiologic studies employing the histoplasmin skin test seems to indicate that latent pulmonary infection with this fungus is common and accounts for many of the pulmonary infiltrations and calcifications which had previously been considered tuberculous in nature.

The geographic distribution of this fungus infection is interesting in that it is endemic in the east-central United States.[3] Other parts of the United States appear to have little, if any, of this infection. Scattered cases are reported from other countries throughout the world. The disease occurs sporadically; the epidemiology[4] and means of spread are unknown.

Approximately 100 proved cases, mostly fatal, have been reported among human beings. In the recent literature, however, a number of case reports have proved that histoplasmosis exists in a nonfatal form.[5,6]

HISTOPLASMOSIS IN ANIMALS

The disease has been found in a number of animals. It has been reported in a mouse (*Mus musculus*) and in 16 rats (*Rattus norvegicus*) by Emmons and his coworkers,[7-9] who have made widespread animal studies in Loudon County, Va. They found positive cultures for the fungus in 2.8 per cent of the rats they trapped but obtained negative cultures from numerous other animals such as rabbits, squirrels, and woodchucks. Previous to these reports, Sangiorgi[10] and Shortt[11] reported what may have been histoplasmosis in rats and in mice. Levine *et al.*[12] reported an intracellular parasite, which may have been *H. capsulatum*, in the ferret. Richman[13] has reported probable histoplasmosis in a horse. This diagnosis was confirmed histologically by the Army Institute of Pathology, but no cultures were procured from the horse in question. It should be mentioned that, histologically, histoplasmosis in horses resembles epizoötic lymphangitis.

TABLE 1—A Summary of Reported Cases of Histoplasmosis in Dogs; All Cases Diagnosed by Histologic Examination*

Case (No.)	Name of reporter	Breed	Age (yr.)	Geographic distribution
1	DeMonbreun[3]	Boston Bull	3	Nashville, Tenn.
2	Thuringer[37]	Foxhound	4	Okla. City, Okla.
3	Callahan[38]	Springer Spaniel	7	St. Louis, Mo.
4	Birge and Riser**[39]	Boston Bull Pekinese	6 5	Des Moines, Iowa.
5	Tomlinson[20]	Springer Spaniel	6	Panama
6	Seibold**[21]	Pit Bull Pit Bull	2½ 2½	Arlington, Va.
7	Para[14]	Mixed		Brazil
8	Emmons, *et al.*[7]	Pit Bull	1	Virginia
9	Harmon**[22]	Fox Terrier Fox Terrier	2 2	Elden, Mo.
10	Anthony[23]	Boxer	1	Kansas City, Mo.

*Tissues of case 1, 7, 8, and 10 were positive for *H. capsulatum* by culture as well as microscopically.
**These authors reported 2 dogs each.

Histoplasmosis has been reported as occurring naturally in at least 13* dogs.[3,7,14,17-23] It is also reported as having been produced artificially by feeding the fungus cultures

*In addition to the 13 reported cases, we are aware of 7 unreported cases: 1 in Detroit, Mich.; 3 in Manhattan, Kan.; and 3 in Nashville, Tenn. (1 diagnosed by ourselves, 1 by Dr. C. J. Peterson of Vanderbilt University, and 1 by Dr. W. A. DeMonbreun of Nashville General Hospital). Among these proved cases of canine histoplasmosis, 13 reported and 7 unreported, it is interesting to note the prevalence of the brachycephalic breeds (*see* table 1).

From the Communicable Disease Center and Division of Tuberculosis, Public Health Service, Federal Security Agency, Kansas City, Kan., and U.S. Bureau of Animal Industry, Agricultural Research Administration.

Public health veterinarian (Ruhe), Communicable Disease Center, Assigned Field Studies Branch, Division of Tuberculosis, University of Kansas Medical Center; field inspector (Cazier), U.S. BAI, Agricultural Research Administration, Topeka, Kan.

Presented before the Section on Sanitary Science and Food Hygiene, Eighty-fifth Annual Meeting, American Veterinary Medical Association, San Francisco, Calif., Aug. 16-19, 1948.

to puppies.[3] Para,[16] in Brazil in 1936, reported the occurrence of histoplasmosis in a child and dog in the same household. This is the only such case which has been reported. Emmons[7] has found an infected mouse in a household where a dog had previously been found to be infected.

The number of reported cases of canine histoplasmosis would seem to indicate that the dog cannot be overlooked as a possible reservoir of this disease. Emmons and Olsen are the only ones who have systematically searched for this disease in dogs. They found 1 case among 7 dogs, the tissues of which were cultured for fungus. All the other cases mentioned were found by chance at autopsy. Should the dog be important epidemiologically, it appears that all the infections would not be fatal. Emmons and Olsen have further reported that the disease was not transmitted to dogs which were kept in the same cage with a dog known to be infected.

EXPERIMENTAL

In an attempt to secure further information on the subject of histoplasmosis in dogs, we have performed a preliminary experiment to determine the susceptibility of dogs to experimental histoplasmosis.

Five dogs were used in the preliminary experiment. They were 8 to 18 months of age. The dogs gave negative reactions to the histoplasmin skin test (H-15 in 1:100 and 1:10 dilutions) before the experiment was begun.

The dogs were infected by the injection of 1 cc. of a 1:10 dilution of packed *H. capsulatum* yeast cells of strain H-629 isolated from a human case in Kansas City, Kan.[8] The injection was made directly into the right lung, between the sixth and seventh ribs, midway between the shoulder crest and the ventral median line, using a 2-in., 20-gauge needle and a 1-cc. glass tuberculin syringe.

All but 1 of the 5 dogs showed progressive lung involvement when x-rayed. In 4 of the dogs, the involvement was marked with pneumonic areas spreading from the inoculation site to involve most of both lungs. In the fifth dog, lung involvement was not of the progressive type, but marked subcutaneous swelling developed which subsequently broke down to a large ulcer about 6 in. in diameter. This dog showed minimal systemic symptoms but was sacrificed because of the danger of infection to other animals and to the caretakers.

Each of the 5 dogs lost weight progressively, and the general condition of each became poor. Within three to four days following infection, the dogs showed a temperature rise of 2 to 4 degrees, which continued for three to four weeks, or until shortly before death. Other outward signs of a systemic infection were the development by all 5 animals of a severe skin disease with alopecia and pruritus, the development of a bronchitis as characterized by frequent coughing spells, extreme roughness of coat, and general malaise.

Dogs 3 and 4 became acutely ill following experimental infection and died, 1 at two and one-half weeks and 1 at six weeks, after inoculation. Dog 2, as mentioned above, showed signs of infection of the external chest wall with minimal lung involvement. It was sacrificed six weeks after infection. Dog 5 appeared to recover somewhat from the acute infection some ten weeks after inoculation. X-rays still showed considerable involvement of the lungs and it continued to cough and to have a poor coat. The shortness of breath and cough increased after the twentieth week, although the general condition and weight improved. X-rays of the lungs revealed the presence of fluid bilaterally. The dog finally succumbed, approximately thirty-six weeks (8½ months) after infection, either from cardiac failure or excessive fluid in the chest. Dog 1, after showing marked evidence of infection by x-ray and clinical signs, appeared completely recovered some ten months after infection. In ten months, he had gained 11 lb. over his weight at the time of infection, and his chest x-rays were negative.

Weekly skin tests with histoplasmin (an extract of the fungus *H. capsulatum*) using lots H-15 and H-40* in 1:100 dilution, showed that all dogs, except the 1 which died two weeks after inoculation, developed skin sensitivity within three weeks.

We were unable to utilize the blood of these dogs for complement-fixation tests, because the blood was anticomplementary.

After death, each animal was autopsied using separate sterile instruments for each tissue explored. Grossly, it was evident that dogs 3 and 4 died of pneumonia involving the right upper lobe with considerable enlargement of lymph nodes in the right hilar area. Bilateral pleural effusion, with small foci of infection occurring as yellowish-white tubercles on left lung, suggested that contralateral infection had occurred. Livers and spleens on these 2 animals were apparently normal in size and color, though quite friable. Other organs appeared normal.

On dog 2, which was destroyed because

*Procured from Dr. Arden Howell, Public Health Service, Kansas City, Kan.

of the ulcer on the chest wall, autopsy showed the ulcer surface to be granulated and covered with yellow pus having a strong offensive odor. Edema of right chest wall and abdominal wall with multiple sinus tracts was evident on opening the body. The

TABLE 2—Results of Cultures for Histoplasma Capsulatum from the Various Organs of Experimentally Infected Dogs

Tissue	Dog*			
	2	3	4	5
Lung	+	+	+	+
Mediastinal lymph node	+	+	+	—
Spleen	+	+	+	—
Adrenal	+	+	+	....
Liver	+	+	+	—
Kidney	+	....	....	....
Thoracic wall	—	....	....	....
Pericardium	....	+	....	....
Pleural fluid	....	+	....	—
Abdominal nodes	....	+	....	—

+ = Tissue cultured, causative organism isolated.
— = Tissue cultured, causative organism not isolated (or over-growth by saprophytic fungi caused culture to be discarded).
*Dog 1 still living; dog 2 infection of external chest wall; dog 3 died 6 weeks after date of infection; dog 4 died 2½ weeks after date of infection; dog 5 died 36 weeks after date of infection.

right lung was shrunken and firmly adherent to the chest wall and mediastinum. Between the right upper lobe and mediastinum, a granulomatous mass, identified as lymph node, approximately 1½ in. in diameter was seen. There was no evidence of dissemination of this infection to the other lobes of the lung or to any of the organs.

The fourth dog (No. 5) to die exhibited almost complete lung collapse and considerable pleural fluid bilaterally. The liver was enlarged and quite friable. The spleen was considerably atrophied with characteristic color lacking.

Samples of lung, thoracic and abdominal lymph nodes, spleen, liver, and adrenal glands were retained from each dog for culture. The organism *H. capsulatum* was recovered, as seen in table 2. It is interesting to note that cultures of the organs of dog 6, which died eight and one-half months after infection, were positive from the lung only.

Histopathologic examination of the tissues is being made by Dr. Arden Howell, Public Health Service, for the presence of *H. capsulatum*.

DISCUSSION

A review of the literature on histoplasmosis in animals has indicated that this disease may not be as rare as once considered. Indeed, there is a question as to whether some animal may serve as a reservoir of the disease, and that human beings may be infected from this animal reservoir. Both rats and dogs have been found which were naturally infected. Evidence presented in this paper indicates that dogs have considerable natural resistance to the disease, since even massive doses of the parasitic phase of the organism were not uniformly fatal. The infected dogs developed skin sensitivity to histoplasmin which persisted in the dog which recovered. This offers a possible diagnostic aid in further investigations of the epidemiology of the disease.

In addition to studying the resistance of dogs to experimental histoplasmosis, a study has been made of the epidemiology of this disease in cattle, by means of skin tests employing histoplasmin. For the purposes of this paper, it is sufficient to report that histoplasmin reactors have been found in cattle, and that their frequency was comparable to positive tests of human beings residing in the same area. In cattle examined in Kansas, no reactors were found in western Kansas, 1.5 per cent were found in central Kansas, and 4.6 per cent reactors were found in eastern Kansas. Previous reports[5] have indicated that histoplasmin reactors among human beings are frequent in eastern Kansas and rare or absent in the western part of the state. For a detailed description of the results of this cattle test, see Furcolow.[15]

It is hoped that this review of histoplasmosis in animals will serve to indicate that this disease should be kept in mind by veterinarians as a diagnostic possibility, especially by those practicing in the Mississippi and Ohio river valleys.

That fungous diseases of animals may be expected to assume increasing importance to the veterinarian is indicated by the results of this review, as well as by the recent report that coccidioidomycosis, another fungous disease of man and animals, may be much more frequent among animals than was suspected.[16] This disease appears to be geographically restricted to the Southwest.

SUMMARY

1) A review of the literature on histoplasmosis in animals is presented.

2) Dogs and rats are the most commonly infected species reported.

3) Experimentally infected dogs developed skin sensitivity to histoplasmin and appeared to be relatively resistant to the disease.

4) Histoplasmin reactors have been found among cattle.

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Gleanings from Committee Reports

(The committee reports will be presented at the 86th Annual Meeting in Detroit, July 11-14, 1949, *and will be published in full in the November* JOURNAL.)

Legislation.—The Association, through the Board of Governors, has gone on record as opposed to Senate Bill No. 5, the so-called socialized medicine, compulsory health insurance bill. Strong opposition has been expressed to Senate Bill 1103 and companion bill H. R. 2945 which provides large increases in second class postal rates. Consideration and support has been given to proposed legislation which would assist in the development of local public health units, and in having Veterinary Corps officers included in extra pay provisions accorded to medical and dental officers. Legislation which would provide federal funds for medical education is being considered by the Association of Deans of the American Colleges of Veterinary Medicine and the Council on Education.

Public Relations.—To veterinarians who are too busy to give much time or thought to public relations problems, the Committee can state that the profession is accorded a greater measure of public esteem and appreciation than ever before. However, it repeats again that a high standard of service rendered by the individual veterinarian in his community is the most effective way to promote favorable public relations.

Wild and Furbearing Animals.— A new course, "Disease of Furbearers", has been added to the curriculum at Washington State College. Progress has been made in the preparation of a text book, and certain chapters are completed. The Committee recommends the work be continued, and that the AVMA assist in the publication of the text book when the manuscript is completed.

Research Council.—The AVMA fellowships have stimulated young veterinarians to do research work. The fruits are being realized. The Council is functioning smoothly and it recommends appointment of a standing AVMA research fund committee to provide an annual income to expand the research training program.

Ethics.—Arrangements have been made,

and invitations extended, to all state chairmen to meet with the Committee at the Detroit convention on July 11, the purpose being to coördinate all our efforts to curb unethical practices.

Registry of Veterinary Pathology.—For the nine months from March 25, 1948 to January 1, 1949, a total of 1,671 cases was added. This is a sizable increase over the preceding year when only 1,296 cases were added.

Diseases of Small Animals.—Two obstacles must be overcome before the problem of insufficient research on canine diseases can be solved. They are: (1) finding a liberal source of funds for financing the research, and (2) locating qualified personnel to conduct research.

Joint Committee on Foods.—The Committee recommends it be continued for (1) conducting chemical tests and biological assays (protein evaluation and dog feeding tests) on any dog food for which the Seal of Approval is applied, and (2) to serve in an advisory capacity to the coöperating associations.

History.—The Committee recommends: (1) a definite outline of its activities should be developed and approved by the House of Representatives; (2) it should be made permanent and members appointed for five-year terms with staggered tenure of office; (3) and the Committee should be given authority to employ full-time assistance and be provided with the funds to carry out the work.

Motion Picture Library.—Our library consists of twenty-one films, sound and silent, at the present time. These films were shown a total of 54 times from April 1, 1948 to March 1, 1949. Requests for films are increasing as more and better films are added to the library.

Nutrition.—Malnutrition denotes a deficiency of essential nutrients in the tissues rather than in the diet. Any factor interfering, therefore, with the utilization of essential nutrients may precipitate nutritional deficiency despite the composition of the diet.

Nomenclature of Diseases.—The activities of this Committee have been concerned with the development of a system for classifying, codifying, and cataloging the diseases of animals. It has been necessary to modify and revise many of the items listed in the manual, "Nomenclature of Disease" (human) to meet the requirements of the veterinary medical field. The full and complete report will require the publication of a manual containing 700 to 800 pages.

Biological Products.—The AVMA should consider forming a joint council on biological products and pharmaceuticals which would be provided with funds and authority to subsidize the investigation of new products by competent institutions, and make recommendations for their proper use.

Parasitology.—This report consists of three parts: (1) the names of the parasitic diseases of dogs and cats; (2) the list of drugs and chemicals unanimously approved; and (3) the drugs and chemicals considered but not unanimously approved.

National Board of Veterinary Examiners.—All organizations and groups which are to be represented on the National Board of Veterinary Examiners have been notified to complete their selections before the AVMA meeting in Detroit. As soon as selections have been made, a meeting for the purpose of incorporation and organization will be held.

Food and Milk Hygiene.—To further implement the proper meat inspection at the municipal, county, and state levels, drawings and specifications have been prepared indicating minimum, basic sanitary requirements for the proper conduct of adequate antemortem and postmortem inspection of meat.

Humane Act Award.—In communicating with veterinarians, it has been stressed that the Committee would be especially pleased to receive nominations from members of the profession. In the past, most nominations have been received from outside sources.

Veterinary Services.—Millions of dollars are spent uselessly every year by livestock farmers for remedies and cures. Even good products used indiscriminately and without proper knowledge of their value and limitations do not help the economy of the livestock producer. A booklet is being prepared to tell the value of veterinary medicine and the veterinarian to the community.

Poultry.—In anticipation of future needs for veterinarians in the poultry-disease research field, the Committee emphasizes the opportunities for life-long careers in this interesting phase of veterinary medicine.

Equine Encephalomyelitis in Louisiana

The accompanying map shows the distribution of cases of equine encephalomyelitis reported in Louisiana in 1948. The

figures were compiled from 48 questionnaires returned by practicing veterinarians of the state. The 35 cases listed are all based on clinical diagnoses. To our knowledge, no brains were submitted to laboratories for virus isolation, nor were blood samples tested for neutralizing bodies.

No cases of human encephalitis were typed as being of equine origin during the equine encephalomyelitis season. This is in contrast with the 26 human cases reported during the 1947 outbreak (*see J.A.V.M.A.*, 113, *Sept.* 1948): 267-270). —*W. T. Oglesby, D.V.M., Louisiana.*

Excerpts from a Presidential Address

"The near-eradication of tuberculosis in cattle is one of the great achievements of the veterinary profession, but if practicing veterinarians do not wake up and help more than they have in the past few years, the work will fall into the hands of others, and we will have lost a great project that we started, but let fall by the wayside. . . .

"I believe we owe it to the men who worked so hard for this program in the past, to ourselves, to the livestock industry, and to the people as a whole, that this work be carried on efficiently and as rapidly as possible. . . .

"Because veterinarians have been unable to give more of their time to the brucellosis program, there is a strong movement toward the use of nonveterinary technicians in their stead, and several states are now employing them. The veterinarians in Iowa either will have to bestir themselves or let the program fall into the hands of those in a position to carry on, and I am certain the profession does not want this to happen."

These three quotations (*Iowa Veterinarian, 20,* (March-April, 1949) :13-15) are from the address delivered before the Sixty-First Annual Convention of the Iowa State Veterinary Medical Society in the opening session at Des Moines, Jan. 18, 1949, by its president, Dr. R. B. Helming, general practitioner at Cresco.

A Lethal Disease of Newborn Calves

Stockmen and veterinarians alike consider the economic value of an animal when that animal requires treatment for disease. However, over-all economics dictate that greater attention be given to the newborn and very young animals. It takes a little over two years to put a dairy calf into the milking line, less time to market a beef animal, and but six months to send a pig to market. When we realize how soon the newborn, of so little value, become finished products, we naturally wish to maintain their good health.

Interest is high in the study and treatment of the diseases of the newborn. Impetus was given to this study by the so-called baby pig disease some fifteen years ago. One explanation which seems to withstand more tests than others, was decribed in the *Cornell Veterinarian*, (37 1947: 175) by Geo. A. Young, Jr., and Norman R. Underdahl, of the Hormel Institute of the University of Minnesota. The hypothesis has been repeated by Dr. Young essentially as follows: (1) The dam undergoes a viral infection, either clinical or subclinical, during gestation, which results in the stimulation of antibody to overcome that infection; (2) simultaneous sensitization of the fetuses with the viral antigen or hapten occurs *in utero;* (3) at its first and subsequent feedings of the antibody-rich colostrum of the dam, the sensitized newborn pig is subjected to reversed anaphylactic shock. By this theory, shock is held responsible for the death of the pig.

Recently, a herd condition affecting newborn calves was brought to the attention of this clinic. The owner presented the first calf in a weak condition. At birth, it appeared normal and, in a reasonable time, was on its feet nursing. Some hours later, the calf was found recumbent, very weak, and could not be induced to feed. On examination, the respiration was rapid, the heart "fluttering" and too fast to count, and a diarrhea was present with some weak tenesmus. It died about forty-eight hours after birth. On autopsy, some erythema of the mucosa of the stomach was visible. No other pathology had developed. The owner stated that during the winter 7 calves were born. Four of these had died under similar circumstances. Of the other 3, 2 were weak and not making gains.

A short time ago, a second calf, 1 day old, was brought to the clinic from the same herd. On admission, its temperature was 103.0 F., respiration was rapid and "panting," pulse 120 per minute; a mild diarrhea existed and there was a slight nasal discharge. The owner stated that the calf had nursed once, then weakened and refused to feed again. It was given 350 cc. of citrated blood subcutaneously to sustain life temporarily. Two doses of bismuth were given later which controlled the diarrhea. One capsule of vitamin A, containing 250,000 U.S.P. units, was given daily for three days. For two days, the calf was given 1 qt. of whole milk, three times daily, which was obtained from a cow in the clinic. Since the calf would not eat voluntarily, the milk was administered with a dose syringe. After two days, it drank milk from a pail, consuming about 4 qt. daily. The fifth day the calf was in the hospital, it developed a fever (104.6 F.) and appeared depressed. Sulfamethazine (125 gr.) was administered orally and 63 gr. was given the next day. The following day the temperature was normal, the calf was alert and active and had a good appetite. We felt justified in discharging it to the care of the owner.

While this calf was in the clinic, another one was born. The owner brought it in for examination before it was allowed to nurse. The calf was alert and active. It had every apearance of a newborn, normal calf. A blood count showed red blood cells, 10,680,000; white cells, 13,000, in contrast to our clinic patient which was now 4 days old, whose count was, red blood cells, 7,940,000; white cells, 16,900.

Upon reaching home, the owner found another normal, newborn calf. These two calves were allowed to have one feeding of colostrum from their respective dams. Both became weak and depressed. Food was then withheld for thirty-six hours, after which they were started on milk from an old nurse cow in the herd. Both calves gradually regained strength, and at present are strong and making good gains.

The behavior of these calves suggests a phenomenon analogous to the reaction that occurs in baby pig disease. Possibly, the symptoms are purely circumstantial evidence, but we feel that the evidence is strong. It is clear that the milk of the dam was injurious to the offspring. The milk, however, qualified, through tests, for fluid milk consumption. Milk from cows well along in lactation, and consequently not antibody rich, was not injurious.

The possibility of a heredity lethal factor can be ruled out in this instance. The herd was assembled recently from wide-spread sources. The cows were inseminated by employees of the Michigan Artificial Breeders Association. Since semen is collected from a great number of bulls, it follows that nearly every calf was sired by a different individual.

We are groping in the clinical handling of diseases of newborn calves and this experience may contribute a slight ray to a rather dim light.—*Floyd W. Young, D.V.M., M.S., Michigan State College, East Lansing, Mich.*

NUTRITION

Nutritional Deficiencies in Mink with Special Reference to Hemorrhagic Gastroenteritis, "Yellow Fat," and Anemia

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SERIOUS losses to mink raisers during recent years have been caused by a disease of unknown etiology which has been variously referred to as hemorrhagic gastroenteritis, "yellow fat," "acidosis," and anemia.

Wisnicky,[1] in 1940, reported that a disturbance called hemorrhagic gastroenteritis was one of the chief disease problems in mink and suggested that it was of nutritional origin. The main symptoms were inappetance, emaciation, and bloody diarrhea; the latter usually occurring just before death. The principal changes observed on postmortem examination were liver and kidney degeneration, accompanied by inflammation of the stomach and intestines. Ulceration of the stomach was seen in acute cases.

TABLE 1—Ration Composition

	Basal (%)	High protein (%)	Basal + gelatin (%)
Sucrose	66	55	56
Casein-alcohol extracted	19	30	19
Gelatin	....	....	10
Cottonseed oil	8	8	8
Cod liver oil	3	3	3
Salts No. IV	4	4	4

In 1943, Coombes[2] produced a similar syndrome under experimental conditions and showed that inclusion of 10 per cent fresh liver in the diet cured the disturbance. Confirmatory data[3] at this laboratory showed that, in field outbreaks of this disease, the inclusion of 10 per cent fresh liver in the ration produced curative results.

Other workers have diagnosed a similar disease in mink. Kennedy,[4] in 1947, reported a nutritional anemia in mink and stated that, previous to the knowledge of the curative and preventative effect of liver, it was the most prevalent disease of mink in Canada. The outstanding manifestation noted was an anemia characterized by nucleated and irregular-sized red blood corpuscles. Hemoglobin and red blood cell count were reduced to as low as 40 per cent of the normal.

McDermid and Ott[5] described a condition, seen in diagnostic work in 1947, which they called "yellow fat" because of the grayish yellow color of the fat in the groin region. Paralysis, ulcers in the stomach, and fatty degeneration of the liver were noted as commonly occurring lesions.

TABLE 2—Vitamin Supplements

	mg./100 Gm. of ration
Thiamin	0.2
Riboflavin	0.4
Pyridoxine	0.2
Calcium pantothenate	1.5
Niacin	4.0
Choline	100.0

Chaddock[6] gives a detailed description of a similar disturbance in all mink-raising sections of the North American continent. Losses were as high as 20 per cent on one large ranch in 1944; the average loss on all mink ranches is 2 to 5 per cent. Fatty degeneration of the liver is the most characteristic lesion, although microscopic changes are described in other tissues, especially the nerves, heart, intestines, lungs, and kidneys. Ulceration of the

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stomach mucosa was present in 33 per cent of the mink examined. Quortrup *et al.*[7] reported the pathology of a disease in mink in Washington which they believe was identical with the disease reported by McDermid and Ott.[8] The significant histologic changes in 12 mink studied were nonsuppurative inflammation of the adipose tissue involving the subcutaneous and visceral fat.

SYMPTOMS

In laboratory and field investigations in Wisconsin, we have met a similar problem, especially during late summer, in young growing mink shortly before they reach maturity. It is also seen in the spring in lactating and pregnant females. Symptoms and lesions have varied considerably in the young and in the mature females, probably depending on the degree of deficiency and secondary complications.

In young mink, the largest and fastest growing kit of a litter is most often affected. Death may occur suddenly in some individuals, but is usually preceded by a lingering illness of several days. Inappetence, irritability, weakness, and a bloody diarrhea are the usual symptoms. Anemia is also manifested by a whitish or blanched appearance of the mucous membrane of the eyes and gums. Paralysis, especially of the posterior limbs, may be seen in some animals. This is often accompanied by a constant dribbling of urine in the male. Mink ranchers often refer to the wet, soiled abdomen and inflammed sheath as "acidosis" or "sheath trouble."

In pregnant and lactating females, the symptoms are usually chronic. Severe emaciation, inappetence, and a more pronounced anemia are the common symptoms. Nervousness and paralysis are seen more often than in the younger mink.

LESIONS

On removal of the pelt, the flesh has a pale, edematous appearance. The subcutaneous abdominal fat often has a yellowish brown tint. At times, it is very firm and feels "cheesy." Diffuse petechial hemorrhages may be present in the fat. On

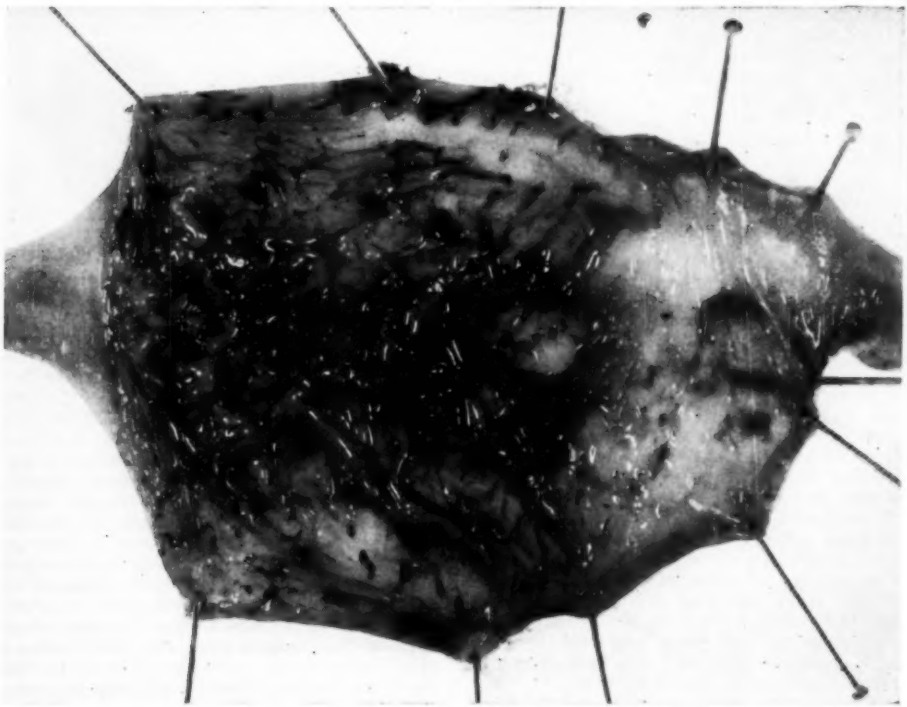
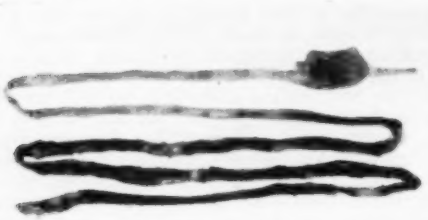


Fig. 1—Enlarged photograph of mucosal surface of mink dying from lack of folic acid. Note free blood and eroded crypt on the mucosal surface filled with blood.

opening the body cavities, fatty degeneration of the liver is evidenced by a dull, yellowish brown color and a very soft texture. Degenerative changes in the liver are almost always present and are more severe



—*University of Wisconsin Photo*

Fig. 2—Same mink as in figure 1 showing free blood in the stomach and partially digested blood at the distal part of the intestine.

in chronic cases. The kidneys also show degenerative changes but of a milder degree than the liver. There is diffuse ulcerative gastritis with considerable blood mixed with the stomach and intestinal contents, especially in acute cases. The eroded areas of the stomach mucosa may not be evident in specimens dead for ten to fifteen hours, but there is, usually, partially digested blood in the first part of the intestinal tract.

In pregnant and lactating females, ulcerative lesions in the stomach mucosa are not as common as they are in the kits. These older animals usually have more severe changes in the liver.

Other tissue changes have been observed on gross postmortem examination, but not as consistently as those mentioned. Secondary complications, especially pneumonia, are not unusual in older mink.

EXPERIMENTAL RESULTS

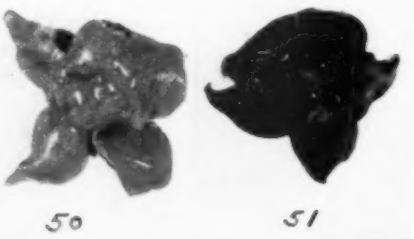
In 1945, research was started using rations of known composition in an effort to further clarify this problem and also to study the general nutritive requirements of mink. The first objective was to determine what factor, or factors, in fresh liver prevented or alleviated this disease. The detailed experimental findings of most of this work has been reported elsewhere,[3] and the intent of this paper is only to report some of the more important clinical and practical results. The experimental rations used are given in table 1.

Ten mature mink were placed on three rations (table 1): 2 on the basal, 4 on the high-protein ration, and 4 on the basal plus 10 per cent gelatin. All of these mink lost weight (10 to 20 per cent) during the following two months. At this time, the decline in weight became more rapid and was accompanied by weakness, inappetence, and a bloody diarrhea. Three of the mink died—1 on each ration. Hemoglobin values obtained shortly before death were 20 to 30 per cent lower than normal, and white cell counts were lowered by 40 to 60 per cent. Gross postmortem lesions were mainly an ulcerative, hemorrhagic gastritis with large amounts of blood in the stomach and intestines (fig. 1 and 2). Congestion of the liver was indicated by a dark red color, swelling, edema, rounded edges, and bulging on the cut surface.

Supplementing folic acid to mink showing the above deficiency symptoms produced a marked response in growth rate, hemoglobin, and white cell values and alleviation of the other deficiency symptoms.

The inclusion of folic acid in all the rations soon restored the weight to approximately what it had been at the beginning of the experiment. Two to three months later, these mink again exhibited a deficiency. The main symptoms were anorexia, anemia, paralysis, and a ragged coat. Liver and kidney degeneration were the main changes noted on autopsy. This deficiency could not be alleviated by the addition of all the other known vitamins or doubling the vitamin supplement (including folic acid). Also ineffective were other supplements such as tomatoes, green ground alfalfa, and fresh pancreas. Dried brewers yeast at the 6 per cent level was partially effective.

Fresh liver (20%) or raw whole milk (25 cc. daily) cured this second deficiency.



—*University of Wisconsin Photo*

Fig. 3—Liver from mink 50, purified ration (minus folic acid and unknown factors) contained 68.9 per cent fat (dry wt. basis). Liver from mink 51, purified ration plus fresh liver and whole liver powder. Contained 10.6 per cent fat (dry wt. basis).

It has been shown more recently, by Schaefer *et al.*,[9] that there are probably two unknown factors in liver which are required by mink.

Mature mink on these three rations plus various dried liver preparations, at the 2 to 3 per cent level, increased in weight from 5 to 25 per cent during a five-month period before showing any deficiency symptoms.

A folic acid deficiency was developed in weanling mink kits in a much shorter time. The symptoms were similar to those described in adult mink. A recurrent folic acid deficiency was produced in a mink kit by supplementing 50 μg. of folic acid and then continuing the ration without folic acid until symptoms appeared the second time. A more pronounced anemia and liver degeneration (fig. 3) was produced under these conditions.

The similarity of folic acid deficiency symptoms and lesions produced with these rations prompted trials with this vitamin in clinical cases of so-called hemorrhagic gastroenteritis. In three field outbreaks of this disturbance, a curative response was noted in mink with early symptoms of the disease, but the results in chronic cases have been inconsistent. Further trials will be needed before any definite conclusions can be made.

DISCUSSION

Most workers are in agreement with respect to the nutritional origin of this disease. The degree of deficiency and secondary complications could account for the discrepancy noted in symptoms and lesions. The value of fresh liver in the prevention of this disease has also been pointed out by Kennedy.[4] His recommendation of ½ oz. daily is approximately equivalent to the inclusion of 10 per cent fresh liver, as is also recommended by this station.

McDermid and Ott[5] believed that a high protein diet was responsible for this disturbance. In our experimental work, symptoms and lesions of this trouble were produced by diets lacking folic acid and unknown nutrients. The basis for recommendations of numerous workers to reduce the protein content of the diet is not well founded and may even lead to serious impairment of growth in young mink. In other species, high protein rations have not been detrimental as long as they are supplemented with adequate amounts of the required nutrients such as vitamins and minerals. Morgan[10] has found that 45.8 per cent protein (casein) gives excellent growth in puppies. Mitchell[11] has summarized the many experiments on the effects of high-protein diets for experimental animals and concludes that continued growth and well being is possible for many months on diets containing 70 per cent or more of protein with no evidence of harmful effects.

The anemia, either in naturally occurring cases or in deficiencies produced on rations of known composition, appears to be significant. This is also supported by Kennedy's findings. It may be that the degenerative changes noted in the liver and the parenchyma of other organs as described by Chaddock[6] are due to anoxemia resulting from anemia.

In many respects (such as the blood dyscrasia, response to folic acid and liver extracts, digestive upset, nerve lesions, and liver degeneration), this disease would appear somewhat similar to Cecil's[11] description of pernicious anemia in man. In certain chronic cases, the lack of response to liver extracts may be partially explained in that irreversible tissue changes have taken place. Kennedy has found that liver is ineffective once the disease has reached a severe stage.

It is recognized that the symptoms of this disease are similar in many respects to other disturbances on mink ranches during the summer months—especially the food poisonings caused by a variety of organic and inorganic substances. Schofield[12] has also described a digestive disturbance in mink due to a virus.

The exact role of the vitamins C, E, K, inositol, biotin, and p-aminobenzoic acid have not been established in this preliminary work. To date, however, using the purified rations described, the need of a dietary source has not been demonstrated. It is also interesting to point out that, besides the critical requirement of unknown factors in liver, the nutrition of mink does not appear to be basically different from other species of animals. As soon as these unknown factors are established and practical sources are available, the possibility of an "all dry" ration for mink may be realized.

CONCLUSION

The symptoms and lesions of a widespread disease in mink are described.

Evidence is presented indicating that it is of nutritional origin.

By use of rations of known composition, it has been shown that folic acid, and also unknown factors in fresh liver and raw milk, are required by mink and are concerned in the etiology of this disturbance.

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Trace Minerals in the Ration

The extensive literature dealing with the feeding of minerals to farm animals has a tendency to make farmers and stockmen feel that they can be fed only in special preparations. This is a wrong concept. Most minerals, with the exception of salt, are fed to animals by way of common feeds. Where farming practices are correct and the ration includes a variety of quality feeds, there is little need to worry about minerals other than salt. There are areas, however, where deficiencies of phosphorus and certain trace minerals exist.

The most important purpose of minerals is to build strong bones, as fully 90 per cent of the dry matter of bones is made up of calcium and phosphorus. Magnesium also plays an important role in bone growth. But the importance of all minerals in the functional activities of the animal body is not so keenly appreciated. Interest is probably increased by the knowledge that farming for generations has leached some of the minerals from the soil. Also the development of our animals for improved production and faster, more efficient growth requires larger amounts of these elements than was needed years ago.

Calcium and phosphorus each need to be fed in the amount of 1/4 to 1/3 of 1 per cent of the entire ration on an air-dry basis. The trace elements need to make up only an extremely small fraction of the entire ration. Iodized salt needs to contain 0.007 per cent iodine to be effective. It takes only ½ oz. of cobalt sulfate mixed with 100 lb. of salt to supply sufficient cobalt. However, unless the ration contains 0.1 part cobalt per 1 million parts of dry matter, livestock will show more or less typical symptoms of cobalt deficiency. Copper is necessary in very small amounts, but a constant intake of excessive amounts is dangerous. A shortage of both copper and iron is seen more often in young animals. Manganese should be present in dairy cattle rations at the rate of 15 parts per million, and in swine rations at the rate of 25 parts per million. In the presence of large amounts of calcium, more manganese may be necessary.

The addition of trace elements to the feed or to salt may be relatively cheap insurance. The average stockman uses about ½ ton of salt a year. The trace minerals could be added to the salt at a cost of $6 to $8 more. This is in contrast to the greatly increased cost of adding these trace elements to all of the mineral used.—*Gustav Bohstedt, University of Wisconsin, in Feedstuffs, Dec.* 11, 1948.

Stiff Lamb Disease

Experiments at Cornell University (*J. Anim. Sci.,* May, 1949) emphasized three points that deserve special consideration in dealing with the problem of "stiff lambs":

1) More cases developed when alfalfa or mixed hay was fed to ewes than when nonlegume hay was provided, although grass hay was not entirely preventive.

2) Low level of total tocopherols in the ewe's milk caused the muscular dystrophy.

3) The condition was cured by administering *alpha* tocopherol (vitamin E) to the lambs, but it was not prevented by prepartum tocopherol supplementation (80 mg. per 100 lb. of body weight), possibly because not enough of the supplement was fed.

Muscular dystrophy is limited almost entirely to thrifty, rapidly growing lambs. Therefore, a ration that does not promote rapid gains may be adequate to prevent the disease.

Thiouracil, propylthiouracil, and thyroprotein administered to lambs in the feed did not indicate any advantage for their use for fattening western feeder lambs.—*J. Anim. Sci., May,* 1949.

Eczema frequently is a sequel to the continued feeding of a ration low in fat.—*C. P. Zepp, Sr., D.V.M., New York.*

Fat Digestion

Attention has been directed to a statement in the article "Fat Digestion" in the JOURNAL (Oct., 1948, p. 360), which said, "A considerable proportion of fats forms carbohydrate and thus participates in liberating energy." This is a controversial point, says Dr. Jesse Sampson, and cites Dukes "Physiology of Domestic Animals" (6th ed., p. 485): "Present evidence indicates that the higher fatty acids containing an even number of carbon atoms are not converted into glucose or glycogen in the animal body." Dr. Sampson also cites Maynard's "Animal Nutrition" (1947, p. 55): "While this formation of fat from sugar takes place very readily, it is doubtful whether the reverse process occurs at all. It is recognized that glycerol can be changed into glucose, but the transformation of fatty acids into carbohydrates has not been proved and is denied by many." Dr. Sampson further states that many American physiologists and nutritionists consider fat an unimportant source of carbohydrate, recognizing that the glycerol fraction (about 10% of the molecule) is probably converted to carbohydrate.

[The editorial on "Fat Digestion" which was published in the section on Nutrition was chiefly a discussion of the *digestion* of fat, not of its *conversion* into energy. We stated: "In sickness and hunger, fat wrapped about the tissues adds little to the chance of survival through the little energy it is able to liberate." Whether the amount used up as energy is "considerable" or precisely 10 per cent is less important in a thesis on the function of the intestinal walls in the handling of fats than in the understanding of the exchanges between fat depots and the energy-expending organs. —ED.]

The incidence of calf scours was significantly lowered in calves from dams fed 1 million I. U. of vitamin A daily for thirty days before the calculated parturition, as compared to calves from control dams.—(*J. Dairy Sci.*, 82 (*Apr.*, 1949): 372).

Soybean Phosphorus Completely Nutritive.—All of the phosphorus, both inorganic and that organically bound, present in soybean meal is readily available to animals, as long as they get enough vitamin D and the calcium-phosphorus ratio is favorable. This fact was established by Spitzer and Phillips in tests on rats, pigs, chickens, and cows at the University of Wisconsin.—*Feedstuffs, Oct.* 9, 1948.

Vitamin and Mineral Needs of Swine

A committee on swine nutrition of the National Research Council has reported the following vitamins and minerals as essential to swine health, according to *Feedstuffs* (Oct. 9, 1948):

Vitamins.—Carotene and A, D, thiamin, riboflavin, niacin, pantothenic acid, and pyridoxin.

Minerals.—Calcium, phosphorus, sodium, potassium, iron, copper, cobalt, magnesium, manganese, and zinc.

Intestinal Vitamin Synthesis

Considerable amounts of the B vitamins are synthesized in the intestinal tract of the horse, with the greatest amounts found in the cecum and large intestine. Horses fed a diet low in vitamin B for four months exhibited anorexia, nervousness, incoordination, loss of weight, and general weakness. The administration of thiamin resulted in a recovery from the symptoms, and supplementing the B vitamin-low diet with 30 mg. of thiamin caused animals to gain in twelve weeks the weight lost during the previous twenty weeks.—*J. Anim. Sci.*, 8, (*May*, 1949.): 290-219.

Ubiquitous Phosphorus Deficiency.—Because lack of phosphorus intake effectively checks growth and especially osteogenesis, and because of the unequal distribution of that element throughout the world, phosphorus deficiency is, perhaps, the most common deficiency disease of animals.

The protein requirement in cattle for efficient roughage digestion is extremely low when roughages are fed in the absence of starch or starchy grains. Likewise, when starch forms part of the ration the need for protein, dried skimmilk, is increased.

Northwestern University research has shown that the body is capable of absorbing only limited daily doses of thiamin (about 5 mg. in man), which would indicate that the use of large, oral doses is wasteful.

Iodine deficiency in livestock may crop up in an iodine-adequate area due to importation of feeds grown in deficient areas—and the same obtains for cobalt and other minerals.

Without a grain of food in a carload, a pack of cigarettes costs as much as a quart of grade A milk.

EDITORIAL

Layman Employment a Maladjustment

Touching upon the employment of laymen for professional work in the government service, Dr. F. W. Crawford, in his presidential address before the National Association of Federal Veterinarians, stated: "This is setting a precedent that may readily become routine procedure. Can the livestock industry and the general public afford to be satisfied with the limited efficiency of the nonprofessional services? The question is pertinent for the situation is critical today to the veterinary profession, the livestock industry, and the general public."

Old-timers well remember that when foreign countries banned the importation of American meat on account of the rumor that our meats fell below acceptable standards, Dr. Ostertag, celebrated German veterinarian, was sent over to investigate our meat-inspection system. As the story goes, the bans were lifted on the stated ground that the inspection was found to be well managed and the inspectors were veterinarians selected by civil service examination. This bit of history carries a warning for the "general public" to ponder. The meat industry and the veterinary profession know that loss of the public's confidence in meat inspection is the price they will have to risk on account of nonprofessional service.

Postgraduate Programs

There is so much to learn before and after completing a course in veterinary medicine that each branch of the service finds itself complaining that its field is neglected in the college curriculum. But Dean Hagan regrets that history, economics, psychology and other subjects are not included in the pre-veterinary curriculum.

Even the general practitioner, who gets the lion's share of practical training, soon admits there is still a great deal to learn. The small animal clinician takes a tour of duty in a hospital. The meat inspector has to learn his art in the abattoir or special school. The livestock sanitarian takes his graduate work on the farm and ranch. Praiseworthy laboratorians come up the slow and hard way.

Speaking from twenty-two years experience in the BAI, President F. W. Crawford, of the National Association of Federal Veterinarians, found that new appointees make a poor showing on the killing floor.

Veterinary medicine has all the domestic genera, with their varied needs and susceptibilities, to crowd into the training of its personnel. Judging from what one hears and reads, the plea is for more so-called practical training. Well and good, providing that program is not carried out at the expense of the basic knowledge required to round out a medical education. Better to realize that in our profession, as in all others, the school of application takes over on commencement day and starts to train graduates on the work they have chosen to pursue.

In short, until the profession has established a systematic postgraduate program, too much must not be expected of the colleges. Their work is undergraduate, not postgraduate, training. Summed up, working out a system of postgraduate veterinary education, such as the intern plan of the medical profession, is on our agendum of unfinished business.

Human and Veterinary Medicine

In actual practice, human and veterinary medicine are closely related; in fact, they frequently overlap. In this connection, veterinarians can be justly proud of the record they have made in reducing bovine tuberculosis to a very low figure. It must be remembered, however, that a reservoir of infection does remain — and that its presence warns of impending trouble if we become complacent about the status of this disease.

On the other hand, veterinarians cannot reject the responsibility for failing to eradicate rabies. For more than one hundred years, we have recognized the methods by which this disease could be eradicated, and failure to institute proper eradication measures stands as a stigma on the record of the veterinarian.—*W. R. Krill, D.V.M., Ohio.*

There is not a better word in the English language than "veterinarian" to identify members of our profession.—*AVMA Release to Professional Publications.*

The Challenge of Practice

Doing easy things does not tax us, neither does it challenge us. It is a good plan to make it a point to tackle one hard problem every day (*The Toastmaster*, June, 1949). This applies specifically to every veterinarian, but especially to the practitioner. He who continues to conduct his practice in a routine manner—acting from habit instead of along consciously directed lines—remains an ordinary practitioner. He who answers to the challenge of new problems, new techniques, and new treatments—he becomes an outstanding practitioner.

Should Veterinarians Memorize this Program?

Another 13-point program, offered by a physician and first printed in the *Rocky Mountain Medical Journal*, and reprinted in *Current Medical Digest*, (Apr., 1949), may be applicable to veterinarians as well as physicians. At least, it is thought-provoking and may well provide some worth-while suggestions for veterinarians. A somewhat condensed version of the program follows.

1) Continue to sit on your fat *derrière* and do nothing.

2) Be apathetic and, like 5 million registered Republican voters who failed to vote, do not bother to make your opinion known. If you think that your opinion and vote aren't worth anything, the opposition will agree and act accordingly.

3) Write to your Congressman occasionally, telling him off, and then explain to your younger colleagues how smart you are and what a stinker your Congressman is.

4) Tell everyone you see that the day of free enterprise is over.

5) Moan and groan and issue explosive and unprintable epithets.

6) Refer to your professional leadership as a group of impotent, ineffective, and bumbling ignoramuses.

7) Make speeches before sympathetic lay audiences and those who already believe in free enterprise.

8) Don't bother to tell the heads of your associations what you want them to do. Expect them to find a way for you without your guidance.

9) Scream about high association dues and forget that our friends in trade unions demand many times what we pay: in other words, make the situation as difficult as possible, and then grumble about it.

10) Oppose any program developed by the majority of your colleagues because it demonstrates your superior wit and your general greatness.

11) Remain superbly and learnedly dignified when Joe Doakes asks why you oppose state medicine. Brush him off with any insults you can think of. He will like you for it.

12) Don't bother to use the selling methods which actually bring messages before the public. Continue to depend on occasional radio feature programs.

13) Above all, disregard the "little guy"—with the vote. Tell him nothing; push him around. He doesn't know anything anyhow.

A Directive on Professional Behavior

Inasmuch as the exportation of Canadian cattle to the United States is a matter of vital importance to both countries, sanitary regulations pertaining thereto are also vital. Who in the Dominion shall do the inspecting before the cattle cross the international boundary? Veterinary Director General Childs, forthwith, settles the argument by setting down the qualification of a reliable inspector in an official document dated May 17,1949. The document says:

> In order to facilitate the movement of the cattle intended for export, *veterinary practitioners who are registered and in good standing with their respective provincial associations* and are recommended by the District Veterinarian will, on application for authorization to test and certify cattle for export, be appointed accredited veterinarians for that purpose. [The italics are ours.]

Here is an executive order emphatically expressing the belief that a professional man who fails to give a helping hand to the associations set up and maintained to protect his government in times of need is not to be trusted in the public service. Polite as the quotation may seem, it emphasizes the all-important factors of reliability, competence, unselfishness, duty, and patriotism of practicing veterinarians.

The owner should never allow anyone but a veterinarian to conduct manual examination of the reproductive organs of the mare or capsule her following the cover.—*Dr. V. Tierstein, Western Livestock J.*

For the job of captain of the veterinary service, agriculture of the future will have two strong competitors: (1) veterinary public health and (2) small animal medicine, both reaching for higher scientific levels and for the hearts of the people.

CURRENT LITERATURE

ABSTRACTS

ANTU Poisoning in Dogs

Symptoms of ANTU poisoning are vomiting, rapid breathing with jerky inspiration, hacking cough at expiration, and cold legs, ears, and nose. Death may occur as early as one hour after appearance of symptoms, but two to four hours is the usual interval. The prognosis is always unfavorable.

The important postmortem lesions are hydrothorax, severe pulmonary edema, catarrhal gastroenteritis, unusual amounts of bile in the intestines, and very severe renal hyperemia.

The fatal dose of ANTU for dogs 2 to 14 years old approaches 30 mg. per kilogram of body weight; while for dogs 5 to 10 months of age this figure rises to 85 to 100 mg. per kilogram of body weight. A tolerance for the poison could be developed readily by feeding small doses repeatedly at intervals of one to ten days. Some of these dogs were able to resist ten times the usual lethal dose orally, but they remained susceptible to intravenous and intraperitoneal administration of ANTU.—[*L. Meyer Jones, Dwight A. Smith, and Hilton A. Smith: Alpha-Naphthyl Thiourea (ANTU) Poisoning in Dogs. Am. J. Vet. Res.*, 10, (*April*, 1949):160-167.]

Avian Electrocardiogram (ECG)

Heart disorders, as revealed by the ECG, accounted for few, if any, deaths of birds during a one-year test period. While 15 per cent of the birds which died during the test period had exhibited abnormal or unusual ECG's, approximately 29 per cent of the surviving birds had exhibited similar irregularities. The effect of specific diseases on the ECG have not been studied.—[*P. D. Sturkie: The Electrocardiogram of the Chicken. Am. J. Vet. Res.*, 10, (*April*, 1949) : 168-175.]

Relation of Age to Mastitis

While admitting, as first emphasized by Murphy, that the incidence of streptococcic udder infection increased regularly with advancing age, the authors do not agree that this is the only, or even the primary, explanation. The rate of increase of infection was correlated with herd-management procedures and the degree of exposure. They conclude that the degree of susceptibility is uniform during the first few years of lactation, and that a sound program of management and sanitation, which reduces the duration and intensity of exposure, still forms the basis of a mastitis-control plan.—[*G. R. Spencer and Mary E. Kraft: Pathogenesis of Bovine Mastitis. I. The Relation of Age to Streptococcic Infection. Am. J. Vet. Res.*, 10, (*April*, 1949) : 115-118.]

Equine Encephalomyelitis Virus in the Blood

Following experimental inoculation (subcutaneous and intraperitoneal) of brain suspensions containing the virus of equine encephalomyelitis, the virus could be recovered from blood drawn from the ear vein of guinea pigs and rabbits. The virus was present in sufficient quantity to kill guinea pigs upon intraperitoneal inoculation, but for only a short time (24- and 48-hour samples only).—[*C. H. Kitselman and A. W. Grundman: The Virus of Equine Encephalomyelitis in the Peripheral Circulation of Guinea Pigs and Rabbits Following Artificial Inoculation. Am. J. Vet. Res.*, 10, (*April*, 1949) : 158-159.]

Japanese B Encephalitis

Horses, cattle, sheep, dogs, cats, and rabbits were tested in 1947 in a survey to determine the extent of dissemination of Japanese B virus among domestic animals of Japan. Horses and cattle reacted heavily, sheep lightly, and no reactors were found among the cats, dogs, and rabbits tested. It was demonstrated that the virus could produce complement-fixing antibodies as a result of inapparent infections in horses and probably in cattle.—[*Major K. F. Burns and Minoru Matumoto: Survey of Animals for Inapparent Infection with the Virus of Japanese B Encephalitis. Am. J. Vet. Res.*, 10, (April, 1949) : 146-149.]

Inhibiting Penicillin Excretion in Horses

Penicillin is rapidly excreted by the kidneys when administered parenterally. This excretion can be retarded by administration of caronamide (*see* JOURNAL, Dec., 1948, p. 600).

The present work reports that, for optimum effect, the dosage of caronamide for horses should be 4 to 6 Gm./100 lb. of body weight, both intravenously and orally, immediately preceding the injection of pencillin.—[*E. R. Doll, M. Elizabeth Wallace, and Anna C. Newton: Dosage of Caronamide Required for Inhibition of Renal Tubular Excretion of Penicillin in Horses. Am. J. Vet. Res.*, 10, (*April*, 1949) : 154-157.]

Sludged Blood in Animals

The circulating blood and the blood vessels of live pigs weighing about 25 lb. were studied. This was possible by obliquely illuminating the bulbar conjunctiva with a Shahan ophthalmoscopic lamp, and examining the illuminated field at magnifications of 48x and 64x through a biobjective, stereoscopic Leitz microscope. The procedure proved easy to do, and examinations could be made without anesthetizing the animals.

Normal pigs with normal blood vessels were inoculated with hog-cholera virus. Seven days later, all, or almost all, of the red corpuscles were agglutinated into small, soft masses which did not bulge the terminal arterioles. Many of the blood vessels had contracted to a point where the lumen was completely obliterated.

The authors emphasize that this report raises more questions than it answers, but it does point to an additional diagnostic observation which can be made in connection with this and other diseases. When the findings can be evaluated, a more complete explanation of the nature of disease and the manner of its effect upon the body will be in order.—[*P. D. Beamer, E. H. Bloch, L. Warner, F. Brooks, J. A. Anliker, and M. H. Knisely: Sludged Blood in Three Young Pigs Experimentally Infected with Hog Cholera. Am. J. Vet. Res.*, 10, *(April,* 1949): 111-114.]

Intestinal Worms in Calves

The author concludes that an active immunity can be demonstrated in calves which harbor infections with *Cooperia punctata,* the small intestinal worm, for as long as three months. This adds to the evidence of previous investigators that many parasites of the digestive tract are capable of stimulating the development of resistance or immunity in the host.

The parasite was pathogenic, causing diarrhea, anorexia, dehydration, and progressive emaciation leading (when subjected to repeated exposure) to death. Anemia was not present in any experimental calf, nor was there evidence to indicate that *C. punctata* is a blood sucker.—[*W. S. Bailey: Studies on Calves Experimentally Infected with Cooperia punctata (v. Linstow,* 1907) *Ransom,* 1907. *Am. J. Vet. Res.*, 10, *(April,* 1949): 119-129.]

A Ruminometer

An instrument was devised to compare the relative force of rumen contractions in cattle. A spring scale housing is mounted on a wooden beam shaped like a large spoon. The bowl of the spoon is held on the tuber coxae and the handle of the spoon on the last rib. A rod, passing through ball bearings in the scale housing, is fitted with a disc applied to the deepest part of the paralumbar fossa. The spring in the scale is anchored to the bottom of the housing and attached at the other end to a sleeve which can be tightened on the rod by means of a set-screw. The sleeve also carries the pointer of the scale.

Between expansions of the dorsal sac of the rumen (contractions of the ventral sac), the set-screw is tightened on the rod, and the initial reading on the scale is noted. When the dorsal sac expands, forcing the abdominal wall outward, the disc and the rod are pushed upward against the spring tension, and the pointer registers the pressure in grams.

Results of measurements of 70 cows on a straw and hay ration are given. The relative expansion pressure had a range of 300 to 1,200 Gm., with an average of 600 Gm. Respiration caused a fluctuation of 50 to 100 Gm. The number of expansions of the dorsal sac per 5 minutes ranged from 4 to 13, with an average of 8.—[*Z. S. Goryainova: Appartus for Measuring the Strength of Rumen Contractions (Illustrated). Veterinariya, 26, (March,* 1949) :24-26.]—R. E. H.

Studies on the Sarcomata of the Skin of Dogs

The basis of the classification in this paper is that the histogenesis and the degree of differentiation should be used as criteria for separation of the various tumors of mesenchymal origin. The author presents a review of pertinent papers to support this view. Out of 201 tumors of the skin of dogs, 101 were considered to be of mesenchymal origin. Sixty-seven of these were classified as reticulosarcomata. These are flattened, firm nodules generally up to 2 cm. in diameter, although larger ones were seen. These tumors are usually confined to the corium, although they may be seen in the subcutis. Microscopically, the tumor consists of closely packed cells with eccentric nuclei that may be round, ovoid, or crescent-shaped. Mitotic figures are common. There are necrotic areas within the tumor plus lymphocytes and polymorphonuclear cells. Some tumor cells appear to have phagocytic activity. Although the stroma is sparse, a dense network of argyrophilic fibers can be seen.

Clinically, the reticulosarcomata appear to be of much lower malignancy than the microscopic picture would suggest. It is suggested that perhaps venereal sarcomata are identical with reticulosarcomata in other parts of the skin. A case of skin tumor in a horse is described, which resembles the reticulosarcomata in dogs. In 10 dogs, a diagram of histiocytic sarcomata was made. These differ from reticulosarcomata by being better defined and less firm. They are situated in the subcutis but may be attached to the corium. They vary in size and may be multiple. Almost all the cases were in dogs about 10 years old.

Histologically, the tumor consists of well-defined polygonal cells each with an eccentric round, ovoid, or crescent-shaped nucleus. Giant cells and mitotic figures were also seen. Although argyrophilic fibrils could be demonstrated, they were not present in as dense a reticulum as in the reticulosarcomata. Many cells contained fat droplets. Clinically, these tumors are benign. In 8 cases, there was a new

growth called "sarcoma-like reticuloendothelial system proliferation" which resembled, somewhat, the reticulosarcomata and which were situated in the corium but were much less sharply defined. These proliferations consisted of dense collections of discrete cells having eccentric nuclei with margination of the chromatin. There were giant cells but no cells undergoing division. An abundance of thick argyrophilic fibers could be demonstrated.

The neoplastic nature of these proliferations is questionable, but it is pointed out that there are features in common with the sarcomata. In 16 cases, the skin tumors were highly differentiated and classified as fibrosarcomata.—[*H. E. Ottosen: Studies on the Sarcomata of the Skin of Dogs. Nord. Vet. Med.*, 1, (1949) :7-30.]—A. G. K.

Pregnancy in Mares

Serum gonadotropin from pregnant mares will stimulate the interstitial cells of the testes. The androgenic hormone then will affect the accessory sex glands. In immature male mice or rats, about 3 weeks old, the seminal vesicles are poorly developed and weigh only a few milligrams. The injection of serum gonadotropin results in a noticeable increase in size of these organs. Immature male rats are injected with one dose of 5 cc. of serum. The mice are given 1 cc. of serum on two successive days. After four days, the seminal vesicles are removed and weighed. Three mice or 1 rat and 2 mice are used for each test. The age and weight of the animals must be accurately standardized to preclude errors resulting from the normal variation in size of the seminal vesicles.—[*Fred Dybing: Biologic Test for Pregnancy in Mares by the Use of Male Mice and Rats. Nord. Vet. Med., 1, (1949): 51-56.*] —A.G.K.

Contagious Pyoderma in Swine

This is a disease of young pigs, characterized by the formation of vesicles and pustules about the face and on the trunk. The pustules and vesicles become crusted. The disease has a benign course unless it is complicated by influenza or enteritis. It occurs usually in the warm months of the year. Pyogenic streptococci and staphylococci can be isolated from the lesion. It is possible to produce the disease experimentally in young pigs. The lesions usually heal without the formation of scars. The disease resembles impetigo or ecthyma simplex in man, although in swine the lesions are more widespread. This may be due to the unhygienic nature of the environment, plus the fact that the animals frequently sustain abrasions in the skin. Biting lice provide foci of infection. Prevention consists of the control of lice plus good sanitation.—[*Hjärre, A.: Contagious Pyoderma in Swine. Skand. Vet.-tidskr.*, 38, (1948): 662-682.]—A. G. K.

BOOKS AND REPORTS

Radioactivity

In its present form, this handbook contains not only a compilation of data and formulas, but also sufficient discussion to make the tables more intelligible to persons who may not be throughly conversant with the terminology and details of nuclear physics and tracer methodology. Descriptions of processes and instruments are rather elementary and provide, in most cases, only the principal features. However, the formulas necessary to make computations are presented in all the complexity required for their use.

The book is divided into four parts. Part I deals with the nuclei and radioactivity; Part II, with the measurement of isotopes; Part III, with the biologic and medical application of isotopes; and Part IV comprises the bibliography.

The section of greatest interest to veterinarians is Part III, which discusses such problems as the use of isotopes as tracers; the major organic and mineral metabolites; the use of isotopes in therapy and diagnosis; and the biologic effects of the radioactive elements. These biologic and medical aspects of tracer methodology are presented on a survey basis, since several excellent reviews have provided exhaustive and detailed accounts of the tracer substances.

Although printed copies of this handbook are no longer available for purchase, photoduplicates can be secured from the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, D. C., at $9.00 per microfilm or $112.50 per photostat. Copies may be had on a twenty-day loan basis from the Department of Commerce, Office of Technical Services, Washington 25, D. C.—[*Handbook of Radioactivity and Tracer Methodology. By William Siri. AF Technical Report 5669, U. S. Air Force, Air Materiél Command, Wright-Patterson Air Force Base, Dayton, Ohio. 867 pages. paper.* 1948.]

Constant Companion of the Veterinarian

Vade Mecum du Vétérinaire or "Constant Companion of the Veterinarian", as the title of this book would be expressed in English, is one of the handiest and most complete popular, pocket-sized books on clinical veterinary medicine ever written. Encyclopedic in scope, scientifically up-to-date, and conveniently arranged, this literary gem is kept within reach or in the pocket of about every veterinarian in the world, who reads French. Its translation into English would be a useful undertaking.

The founder and author was the late Prof. Ch. Porcher, distinguished chemist of Alfort, and honorary member of AVMA. Its perpetuation, the greatest of tributes, seems ensured.

The manual comprises an alphabetical description, first of drugs and second of diseases, followed by refresher addenda on a variety of subjects

such as the legal handling of contagious diseases; methods of diagnosis; redhibitory vices; rations of the different animals; hygiene of the skin; hygiene of reproduction, estrus, ovulation, gestation periods; hatching time of eggs; temperature, respirations, pulse rates; humane euthanasia; rodent and insect control; abnormal elements (proteids, ketones, glucides, albumin, peptones, bile, hemoglobin)—all briefed for quick review of easily forgotten data, and abreast of the times.—[*Vade Mecum du Vétérinaire. By E. Nichols and A. Brion. 758 pages, 5½ by 3½ in., in small but readable French type.* 1949. *8th ed. Vigot Frères, Paris 6, France.*]

Fundamental Considerations in Anesthesia

After a brief review of the autonomic nervous system and the changes that occur during general anesthesia, the respiratory pattern and disturbances that occur during anesthesia and at the time of surgical intervention are described. The causes of such complications as laryngeal spasm, circulatory disturbances, parasympathetic reactions, and gastrointestinal autonomic reactions are discussed in detail, as well as the dangers associated with these complications. The correction of these conditions by treatment is thoroughly reviewed.

Of particular interest to veterinarians will be the chapter which discusses in detail the causes of shock and precautions that must be taken with patients suffering from shock.

Although the technique of anesthesia, as discussed, is more detailed than most veterinarians will be able to apply practically, it should be a fine reference book for the small animal surgeons and those working with experimental animals. It will serve as a good review for all veterinarians who need to refresh themselves on the fundamentals of general anesthesia.—[*Fundamental Considerations in Anesthesia. By Charles L. Burstein. M. D. The MacMillan Company, New York.* 1949. *Price* $4.00.]

Veterinary Helminthology

Veterinary helminthology is a dignified term for the study of worms of the domestic animals. This book follows the trend of listing the hosts in the usual order (horse, cow, sheep, goat, pig, dog, cat, chicken, turkey, and furbearing animal), and then enumerating and discussing the intestinal parasites commonly infecting each species. This makes for a text which serves especially well the needs of the practicing veterinarian, who knows the species of the host and desires to identify the parasite either directly or from its ova.

To aid in prompt and accurate diagnosis, a plate, occupying a full page near the end of the book, pictures the helminth eggs found most frequently in making a fecal examination of a parasitized horse. There is a similar page for each species.

The discussion of each common helminth is arranged under the headings: synonyms, common name, disease, morphology, location, life cycle, pathology, diagnosis, treatment, and general remarks. The detail of the description varies with the importance of the parasite. Hand-drawn sketches show the distinguishing features of each worm in complete detail for accurate and quick differentiation. Life cycles are depicted for many helminths and maps show their geographic distribution. The excellent quality of paper used throughout the book makes all of these especially valuable, since they are accurately and clearly reproduced.

The appendix presents parasite lists for the hosts, and the titles of books and publications important in veterinary helminthology.—[*Veterinary Helminthology. By Banner Bill Morgan and Philip A. Hawkins. 400 pages, 8½ by 11 in. 58 page-size plates. Cloth. Offset printing. Burgess Publishing Co., 426 S. Sixth St., Minneapolis 15, Minn.* 1949. *Price* $7.00.]

How to Become a Doctor

The competition that confronts an applicant for admittance to a school of medicine, dentistry, veterinary medicine, and, to a lesser degree, pharmacy and other schools closely allied to medicine, is discussed in this book which is designed to help the applicant succeed. Although dealing primarily with applications for admittance to medical schools, many of the suggestions are equally as valuable for applicants to schools in related fields. Due to the author's experience in medical, dental, and pharmaceutical education, as a registrar and member of admission committees, he is apparently well qualified to advise prospective students.

Such aspects as, "Which College?," "The Interview," "Success and Failure in Medical Schools," "Special Problems of the Medical Student," are discussed under these chapter heads. The academic requirements for admission to the principal schools, the courses taught in the professional schools, the expenses incurred, and a complete listing of the recognized schools in the different professions makes the book a fitting gift for young people considering a medical career.

Veterinarians will question the wisdom of devoting a chapter to "The Pharmacy Program" and listing veterinary medicine as one of the subheadings in a chapter devoted to "Professional Fields Closely Allied to Allopathic Medicine." However, in fairness to the author, it should be pointed out that the treatment of veterinary medical education is certainly fair. His discussion of the opportunities in, and the importance of, veterinary medicine shows that a study of the field was made. All of the accredited colleges of veterinary medicine, with the AVMA listed as the general accrediting agency, as well as the seven new schools, are listed. The usual requirements for admittance to schools of veterinary medicine are listed but, unfortunately, one year of college, instead of the two required by practically all schools, is listed as a prerequisite for admission.—[*How To Become A Doctor. By Geo. R. Moon, A. B., M. A., Cloth.* 131 *pages. The Blakiston Company, Philadelphia and Toronto.* 1949. *Price* $2.00.]

THE NEWS

The 14th International Veterinary Congress

AVMA Tour of Europe

Between forty and fifty persons are expected to sail from New York on the "S.S. Queen Elizabeth" July 15, beginning the escorted tour of Europe under the leadership of Dr. D. M. Campbell of Chicago, in connection with the 14th International Veterinary Congress in London, Aug. 8-13, 1949. A number of other persons are sailing later for the Congress or will fly to London and return by air.

The AVMA tour has been planned and organized during the past several months, as announced in previous issues of the JOURNAL. The names of those in the tour party will be published in a later issue, including a number of veterinarians who were designated as official delegates to represent their respective veterinary associations or institutions.

Programs

Dr. C. P. Zepp, Sr., who will be installed as AVMA President at Detroit in July, will be the official delegate of the Association to the Congress and will also take part in the program of the National Veterinary Association of Great Britain and Ireland, which will convene in London, August 12-15.

Dr. James Farquharson, of Colorado A. & M. College, will also appear on the program of the International Veterinary Congress, in addition to those previously listed (*see* the JOURNAL, April, 1949, p. 260). He will discuss the subject of "Vaginal Prolapse" before the Section on Surgery.

Dr. Jack O. Knowles, of the Knowles Animal Hospital, Miami, Fla., has been invited to appear on the program of the National Association meeting in London to discuss "Pin Fixation of Fractures." Dr. Zepp will also appear on this program to discuss "Surgery of the Ear of Dogs," and Dr. Farquharson will present some of his well-known motion picture demonstrations of surgical technique on the same program.

Dr. J. R. Beach, University of California, replaces Dr. F. R. Beaudette to discuss "The Veterinary Profession's Contribution to the World's Poultry and Egg Supply" on the International program. Dr. E. W. Price has found it necessary to withdraw from the program.

Any veterinarians still desiring to apply for membership in the 14th International Veterinary Congress, even though they are not attending, should send their applications immediately, with remittance of $16.00, to Dr. J. G. Hardenbergh, Secretary, U.S. Committee, c/o AVMA, 600 S. Michigan Ave., Chicago 5, Ill. This membership will insure their obtaining a copy of the published proceedings of the Congress.

AVMA Membership Passes 10,000 Mark

An aim that has guided veterinary leaders for nearly a half century became an accomplished fact as this issue went to press: AVMA membership passed the 10,000 mark for the first time in the Association's history.

AAHA Contest Winners

Awards were presented to the following winners of the Moss Essay Contest of the American Animal Hospital Association at the 16th annual meeting, May 5-7, 1949, at the Edgewater Beach Hotel, Chicago, Ill.:

Peter E. Olson, Colorado A. & M. College, grand prize; Rollin J. Cowles, Iowa State College, second prize; Ivan S. Osborne, Kansas State College, third prize.

The college prizes were awarded as follows:

Colorado A. & M. College.—Peter E. Olson (first); Herman R. Rossel (second); Wendell F. Hutchinson (third).

Cornell University.—George C. Christiansen (first); James B. Wight (second); Karl Reinhard (third).

Iowa State College.—Rollin J. Cowles (first); Myron A. Nelson (second); John D. Melcher (third).

Kansas State College.—Ivan S. Osborne (first); T. P. Seburt (second); D. W. Gregory (third).

AVMA Convention on National Farm and Home Hour

Highlights of the Detroit convention and a discussion of brucellosis will be featured on the National Farm and Home Hour, Saturday, July 16, 1949, 12:00 to 12:30 p. m., Central Daylight Saving time (National Broadcasting Co.). President-Elect C. P. Zepp, Sr., Drs. I. Forest Huddleson and L. M. Hutchings, and other veterinarians attending the convention will be featured on the program.

All veterinarians will want to listen and urge their clients to tune in, too. This is another in the long series of AVMA public relations activities designed to give owners of livestock and pets a better appreciation of what modern veterinary science means to them.

Twenty-Six Constituent Associations Use AVMA Radio Scripts

The weekly seven-minute radio scripts on livestock health, issued by the AVMA as a special service to state and provincial associations, are now being broadcast in 26 states and provinces over more than 40 local stations as well as some networks. Several other states, not listed in the table below, have arrangements pending for use of these broadcasts.

Constituent associations not now participating in this project are invited to write to the AVMA office for details about how they may arrange for local radio time. Sample copies of scripts will be sent on request.

Schedule of State and Provincial Association Broadcasts, as of June 1, 1949

State	Station	Location	Day of Week	Time	Name of Program
Arkansas	KVMA	Magnolia	Every Saturday	11:30 a.m.	.....
Connecticut	WFHA-FM	New Britain	.....	.....	Farm Program
Indiana	WFBM	Indianapolis	2nd & 4th Thurs. of each month	12:30 p.m.	Farm Program
Iowa	WOI	Ames	Every Friday	6:45 a.m.	.....
Kansas & Missouri (coöperative)	KMBC	Kansas City, Mo.	Every Saturday	12:30 p.m.	Farm Hour
Kentucky	WHIR	Danville	Every Wednesday	11:05 a.m.	.....
	WHAS	Louisville	.....	12:45 p.m.	Farm Markets
Michigan	WKAR	East Lansing	Every Friday	1:15 p.m.	Diseases of Farm Animals
	WWJ	Detroit	2nd & 4th Thurs. of each month	6:30 a.m.	Farm Program
Minnesota	KUOM	St. Paul	.....	12:30 p.m.	Farm Hour
	WCCO	Minneapolis	.....	12:30 p.m.	Farm Hour
Nebraska	KFAB	Lincoln	Every Thursday	6:30 a.m.	"Down to Earth"
Nevada	KOH	Reno	.....	12:45 p.m.	Farm News
New York	WJZ	New York City	.....	6:00 a.m.	Farm News Program
	WGR	Buffalo	Every Monday	6:30 a.m.	Farm Program
	WHAM	Rochester	Every Saturday	6:15 a.m.	Farm Program
North Carolina	WWNC	Asheville	Every Monday	12:45 p.m.	Farm Hour
	WLTC	Gastonia	Every Thursday	12:20 p.m.	Farm Facts & Highlights
Ohio	WBEX	Chillicothe	Every Tuesday	12:15 p.m.	Farm Program
	WONE	Dayton	Every Friday	12:45 p.m.	Buckeye Farmtime
	WOSU	Columbus	Every Friday	12:00 noon	Farm & Home Hour
Oklahoma	KLPR	Oklahoma City	Every Wednesday	10:45 a.m.	Oklahoma Vet. Med. A.
Pennsylvania	WPEN	Philadelphia	.....	12:05 p.m.	The Doctor and Lawyer
South Dakota	KELO	Sioux Falls	Every Friday	6:10 a.m.	.....
Tennessee	WSM	Nashville	Every 4th Monday	12:30 p.m.	Noontime Neighbors
	WBAC	Cleveland	Every Friday	1:00 p.m.	Farm & Home Hour
Texas	WTAW	College Station	.....	6:00 a.m.	Farm & Home Program
Virginia	WPUV	Pulaski	Every other Fri.	1:30 p.m.	Farm Hour
Washington	KPUG	Bellingham	Every Thursday	7:30 p.m.	Care of Your Animals
Wisconsin	(Various stations)	.....	.....	.....	.....
British Columbia	CBR	Vancouver	Every Friday	12:00 noon	Farm Program
Manitoba	CBW	Winnipeg	.....	1:45 p.m.	CBC Farm Broadcast
Ontario	CKCO	Ottawa	Every Wednesday	12:15 p.m.	Farm Program
Quebec	CJSO	Sorel	.....	1:00 p.m.	Conseils Agricoles
	CKAC	Montreal	.....	6:30 a.m.	L'Eveil Agricole
	CBF	Montreal	Every Tuesday	12:00 noon	.....
	CKAC	Montreal	Every Friday	12:30 p.m.	Réveil Rural

AVMA Research Fellows

A. W. Monlux was born Jan. 29, 1920. He was educated at Iowa State College (D.V.M. 1942, M.S. 1948). He practiced at Woden, Iowa, in 1942; served in the Veterinary Corps, U.S. Army from 1943 to 1946; and returned to the veterinary faculty at Iowa State College 1946 to 1948. In

Dr. Andrew W. Monlux

September, 1948, he reported at the Army Institute of Pathology to work under his AVMA fellowship jointly at the Institute and at George Washington University, Washington, D. C.

PLAN OF THE PROJECT

The course work being absolved is human pathology, biochemistry, bacteriology, physiology, and histology. Tissues and case reports of selected specimens received by the Registry of Veterinary Pathology are being reviewed. Attention is being concentrated upon the pathologic anatomy of the kidney, particularly with respect to the nonsurgical diseases of domestic and laboratory animals.

A definite problem will be selected later, but it will probably center around the relationship of pathologic changes to specific disease entities in man and the domestic animals.

STUDENT CHAPTER ACTIVITIES

Dr. Krill Speaks at Cornell Honor Day Program.—Dr. Walter R. Krill, dean of the College of Veterinary Medicine, The Ohio State University, and chairman of the Executive Board of the American Veterinary Medical Association, spoke at the Honor Day Program at Cornell University on May 13, 1949. Dr. W. A. Hagan, dean of the New York Veterinary College, and past president of the AVMA, presided.

This year's Borden Veterinary Scholarship Award was presented to Karl R. Reinhard, Ithaca. Other prizes were awarded as follows:

The Horace K. White Prize — Karl R. Reinhard (first); Wayne Jensen, Burwell, Neb. (second); Gerald M. Ward, Towanda, Pa., and William H. Keaton, Hollister, Calif. (honorable mention).

The Addison D. Merry Prizes, Class of 1950—Jean Holzworth, Port Chester, N. Y. (first); Robert J. Harris, Bardolph, Ill. (second); Henry L. Szlachta, Paris, N. Y. and Lynn G. Palmer, Carthage, N. Y. (honorable mention). Class of 1951—Jay R. Georgi, New York City (first); Robert Cello, Great Kills, Staten Island (second); Alan A. Leventhal, Ithaca, and John S. Sickles, Pearl River, N. Y. (honorable mention).

The Jane Miller Prizes, Class of 1950—Jean Holzworth (first); Joseph Pulco, Jr., Buffalo, N. Y. (second); Donald H. Crispell, Slaterville Springs, N. Y. and Malcolmn C. Peckham, Taunton, Mass. (honorable mention). Class of 1951—John S. Sickles (first); Robert M. Cello (second); Jay R. Georgi and Alan A. Leventhal (honorable mention).

The Charles Gross Bondy Prizes—George C. Christensen, Staten Island, (first); Wayne Jensen (second); Christabel Hamilton Frederick, Oak Park, Ill., and James R. Wheaton, East Rochester, N. Y. (honorable mention).

The Anne Besse Prizes—William H. Keaton (first); Gerald M. Ward (second); Willard H. Daniels, Middletown, Conn., and Isadore Yasgur, Monticello, N. Y. (honorable mention).

The James Gordon Bennett Prizes—Willard H. Daniels, (first); Raymond F. Birchard, Cambridge Springs, Pa., (second); Marianne F. Smith, New York City (honorable mention).

The Mary Louise Moore Prizes—Karl R. Reinhard (first); Wayne Jensen (second); Marianne F. Smith (honorable mention).

The Poultry Disease Essay Prize—Wayne Jensen.

The Alpha Psi Prize—Wayne Jensen.

The New York State Veterinary Medical Society Prizes—Bennett J. Cohen, Brooklyn (first); Herbert H. Quimby, Malone, N. Y. (second); John E. McCormick, Sanborn, N. Y. (third); William E. Taylor, Morrisville, N. Y., and Gerald M. Ward, William H. Keaton, Stanley Glick, Mountaindale, N. Y. (honorable mention).

The formal program was followed by a dance sponsored by the Cornell University Student Chapter of the AVMA.

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Kansas Chapter Review of 1948-1949—The AVMA Student Chapter of the Kansas State College opened 1948-1949 activities with a smoker in the Community House, with 269 students welcoming the incoming class of 70. Dean E. E. Leasure spoke briefly and introduced faculty members. Officers for the first semester were John Woolsey, *president;* Sidney Marlin, *president-elect;* Charles Hunter, *vice-president;* Robert McNabb, *secretary;* Hubert Weeks, *treasurer;* William Boley, *critic;* and Orlan Pfeiffer, *marshall.*

Outstanding speakers for the school year were:

Dr. Glynden T. Easley, Turner Ranch, Sulfur, Okla.: "Artificial Insemination" and "The Duties of a Ranch Veterinarian."

Dr. B. W. Lafene, director of student health of the College: "Histoplasmosis" (with illustrations).

Dr. Joe Knappenberger, Kansas City, Mo., conducted a question and answer forum.

Dr. Yen Shyong Liao, Kiangsi, China, graduate student at the College: "Veterinary Medicine and Animal Husbandry in China."

Dr. N. H. Casselberry, Cutter Laboratories, Berkeley, Calif.: "The Organization and Operation of a Biological and Pharmaceutical House."

Dr. Glen Case, Kewanee, Ill.: Swine Practice."

Dr. R. C. Klussendorf, assistant executive secretary of the AVMA, Chicago, Ill.: "The AVMA and the Purpose of the Student Chapters."

Dr. J. L. George, Chester, Neb.: "Practice Problems."

Second semester officers were Charles Hunter, *president-elect;* Raymond Swart, *vice-president;* Alex Hogg, *secretary;* James Neal, *critic;* and J. W. Berchem, *marshall.*

Social activities included an informal dance, a banquet, and a family picnic.

Five seniors were elected to Phi Kappa Phi. They were John P. Hughes, Donald L. Croghan, Darrell C. Phillips, Peter C. Kennedy, and John M. Aiken. The nine seniors elected to Gamma Sigma Delta, honorary agriculture fraternity, in addition to those selected to Phi Kappa Phi, were Stanley Jacobs, Jacob Fortenberry, David Gregory, and John Woolsey.

Winners of the Kansas Veterinary Medical Association's awards for general proficiency in veterinary medicine were Donald Croghan, first prize, and John M. Aiken, second prize.

Frank Murry was elected to the Student Council as representative from the School of Veterinary Medicine.

Officers for the fall semester, 1949, are Charles Hunter, Manhattan, *president;* Harvey Arand, Belvue, *vice-president;* John Gamby, Everest, *treasurer;* Ross Mosier, Hoxie, *secretary;* Bob Steele, Conway, *marshall;* Busch Meredith, Olathe, *critic.* Ed Moore, Parsons, *president-elect.*

s/ALEX HOGG, *Secretary.*

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Iowa Chapter Review of 1948-1949.—Officers for the first term were Stanley King, *president;* R. Jim Cowles, *president-elect;* Richard Williams, *vice-president;* Leland Bunge, *secretary-treasurer;* Guy Flater, *critic;* and Dr. Frank Ramsey, *faculty advisor.*

Outstanding speakers of the year were:

Mr. Scott Ellis, Dallas Center: "What the Livestock Grower Expects of the Veterinarian."

Dr. Ronald Wells (Ph.D.), Department of Religious Education: "Professional Ethics."

Dr. A. B. Hoerlein and Dean H. D. Bergman: "Significance and Objects of National Honorary Veterinary Fraternities."

Mr. A. Anderson, Division of Agriculture: "Swine Production and Management in Iowa" (with illustrations).

Dr. J. G. Louw, Veterinary Research Institute, University of Pretoria, South Africa: "Plant, Personnel, and Work at the Pretoria Research Institute."

Planned activities for the future include training new staff members for the *Veterinary Student;* an educational program on attendance and participation in AVMA activities; a unified alumni program; and an attempt to give each veterinary student experience in leadership through participation in committees and other activities.

The Chapter has proved that self-government can work, through its honor code system, whereby infractions are solved by members of the class in coöperation with the dean and the college Government Committee.

Social activities sponsored by the Chapter included the fall banquet, Christmas party, and winter dance.

s/ROLAND C. BUNGE, *Retiring Secretary.*

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Change Publication Name.—The I.S.C. Student Chapter of the AVMA has changed the name of its publication *The Veterinary Student* to *The Iowa State College Veterinarian.* This change was deemed desirable, as the former name failed to identify the publication with Iowa State College. Furthermore, many subscribers and advertisers believed that the circulation was limited to students. The change will be effective with the first issue of the next school year. It is hoped that the new name will serve as a better indication of the source and circulation of this magazine.

s/LEROY G. GUNNING, *Secretary.*

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Missouri Chapter.—The Veterinary Club of the University of Missouri met in the Veterinary Hospital May 18, 1949. Officers elected for the fall semester are W. Crenshaw, *president-elect;* Harold Pilcher, *vice-president;* Leland Rice, *secretary;* and Taylor Lane, *treasurer.*

s/E. J. KRAUTMANN, *Secretary.*

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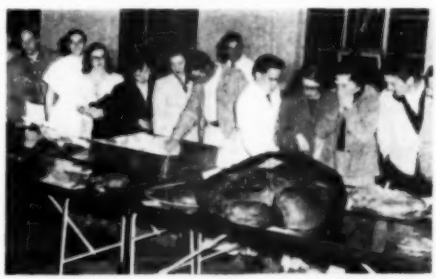
Washington Chapter.—On April 19, the Washington State College Student Chapter of the AVMA held open house at the College of Veterinary Medicine with an estimated attendance of 700, many of whom were from outlying districts. In the past, the attendance at the open house has been limited to veterinary and pre-



One of the exhibits prepared by the Washington State College Student Chapter of the AVMA.

veterinary students and their families. Because of the favorable comments and the large attendance this year, it is planned to present similar programs, open to the public, annually.

The program included a review of courses taught at the College, demonstrations of materials and techniques, and a conducted tour of

Taken during the annual open house of the College of Veterinary Medicine, this typical group indicates interest with which the program was received.

the classrooms, museums, and laboratories. The purpose was to show the part played by the veterinarian in modern society, and to emphasize the scientific training and medical knowledge required of graduates of veterinary medicine.

s/JESSE F. BONE, *Publicity Chairman.*

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

DILLARD, WILLIAM M.
910 Jordan St., Mt. Vernon, Ill.
D.V.M., Alabama Polytechnic Institute, 1948.
Vouchers: A. B. Douglas and C. R. Dean.

HICKS, CHARLES S.
Carrollton, Ky.
B.V.Sc., Ontario Veterinary College, 1940.
Vouchers: C. F. Gobert and H. A. Calldemeier.

JOHNSON, LESLIE E.
Rushville, Ill.
D.V.M., Ohio State University, 1930.
Vouchers: C. W. McLaughlin and G. J. MacLean.

LOMAS, JOSEPH C.
668 No. 3 Rd., Lulu Island, Vancouver, B. C.
D.V.M., Ontario Veterinary College, 1943.
Vouchers: G L. Davis and E. L. Nundal.

MARKHAM, EARL S.
20 West Street, Constableville, N. Y.
D.V.M., New York State Veterinary College, 1912.
Vouchers: J. J. Regan and J. G. Hardenbergh.

RICHTER, JACOB B.
1628 Nedro Ave., Philadelphia 41, Pa.
V.M.D., University of Pennsylvania, 1935.
Vouchers: F. E. Lentz and S. A. Steiner.

SCOTT, ROLLAND O.
56th Medical Group, Selfridge Air Force Base, Mich.
D.V.M., Michigan State College, 1936.
Vouchers: I. H. Wood and C. P. Hodder.

SMITH, LAWRENCE T.
Ontario Veterinary College, Guelph, Ont.
D.V.M., Ontario Veterinary College, 1943.
Vouchers: A. F. Bain and T. Lloyd Jones.

TOWNSEND, JOHN G.
P.O. Box 3, Sandown, Johannesburg, Union of S. Africa.
B.V.Sc., University of Pretoria, 1944.
Vouchers: G. Martinaglia and J. G. Hardenbergh.

WOODWARD, BENJAMIN T.
2315 Riverside Dr., Santa Ana, Calif.
V.M.D., University of Pennsylvania, 1902.
Vouchers: G. H. Hart and L. M. Hurt.

WRIGHT, HAROLD E.
728 S. Main, Ann Arbor, Mich.
D.V.M., Michigan State College, 1918.
Vouchers: R. F. Langham and B. J. Killham.

Second Listing

BERLIN, SEIBERT L., McConnellsburg, Pa.

BOOKMAN, PHILIP, 124 Mapes Ave., Newark 8, N. J.

MAGILL, JOHN, 608 Second St., Pocomoke City, Md.

POTTER, ROBERT R., Bear Ridge Rd., Pleasantville, N. Y.

1949 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Ohio State University

All of the following applicants with the exception of those otherwise noted, were vouchered by Drs. Walter R. Krill and Clarence R. Cole.

ACKERMAN, ELLA L., D.V.M.
1600 W. Fifth Ave., Columbus, Ohio
Vouchers: H. J. Apple and R. W. Vesper.

ALEXANDER, VERNON G., D.V.M.
319 Sycamore Rd., Lexington, Ky.

ALLEN, JOHN R., JR., D.V.M.
28 S. Mulberry St., Chillicothe, Ohio.

ARROYO, GERARDO, D.V.M.
145½ W. Lane Ave., Columbus, Ohio.

ASHCRAFT, DERWIN W., D.V.M.
180 Longwood Ave., Boston, Mass.

ASHCRAFT, RICHARD G., D.V.M.
180 Longwood Ave., Boston, Mass.
BACKEY, EDSON E., D.V.M.
Salem, Ill.
BARNETT, ROBERT W., D.V.M.
146 Monroe St., Warren, Ohio.
Vouchers: J. V. Crago and W. A. James.
BARTH, MAX E., D.V.M.
Richland Center, Wis.
BEAVERS, HOMER V., D.V.M.
960 Rose Pl., Columbus 9, Ohio.
BRAGG, TAYLOR A., JR., D.V.M.
2676 Knox Rd., Apt. B, Columbus 10, Ohio.
BREHM, PAUL F., D.V.M.
7645 Delmar Blvd., St. Louis 5, Mo.
BUHLER, WARREN E., D.V.M.
1 Park Ave., Lafayette, Ind.
Vouchers: C. R. Cole and V. L. Tharp.
CHAMBERLAIN, DEANE M., D.V.M.
286 Pleasant St., Concord, N. H.
CRAWFORD, HARRY B., D.V.M.
c/o Dr. Eugene Cole, 820 W. 4th St., Seymour, Ind.
DAHLQUIST, CARL A., D.V.M.
6742 Normal Blvd., Chicago, Ill.
DENNIS, LAURETTA M., D.V.M.
Box 101, Jewett, Ohio.
DILL, RICHARD H., D.V.M.
Glasgow Animal Clinic, Glasgow, Ky.
DONOVAN, EDWARD F., D.V.M.
5500 Cleveland Ave., N.W., R.D. 2, North Canton, Ohio.
FREEMAN, THOMAS D., D.V.M.
Mayfield, Ky.
GIBBS, ROBERT R., D.V.M.
938 Esplanade Ave., New Orleans, La.
GLOVER, WILLIAM F., D.V.M.
Milan, Ind.
GOSSETT, FRANKLIN O., D.V.M.
Trailer No.134, Fair Grounds, Columbus, Ohio.
GREGORY, RICHARD P., JR., D.V.M.
R.R. 2, Anchorage, Ky.
GRILLIOT, LINUS J., D.V.M.
c/o Dr. D. J. Wade, Lancaster, Ohio.
HAAS, KENNETH B., D.V.M.
1114 Lake Ave., Wilmette, Ill.
HOLDEN, PRESTON L., D.V.M.
Lewisburg, W. Va.
HOUSEHOLDER, RUTH A., D.V.M.
1051 Gray Ct., N. E., Massillon, Ohio.
ISRAEL, LEWIS L., D.V.M.
11814 St. Clair Ave., Cleveland, Ohio.
JOHNSON, RAMEAU S., D.V.M.
Lemen Veterinary Clinic, Warrensburg, Ill.
KELLER, STANLEY R., D.V.M.
5500 Glenway Ave., Cincinnati, Ohio.
KEYSER, DALE D., D.V.M.
Charles Town, Jefferson County, W. Va.
KINTNER, LOREN D., D.V.M.
Dept. of Vet. Path., U. of Mo., Columbia, Mo.
McCLOUD, GORDON M., D.V.M.
6215 Wilson Mills Rd., Cleveland 24, Ohio.
McCLUNG, ROBERT W., D.V.M.
Y.M.C.A., Bucyrus, Ohio.
MANN, JAMES F., JR., D.V.M.
Lewisburg, W. Va.
MILLER, ROBERT E., D.V.M.
N.W. 5th and L Sts., Richmond, Ind.
MOORE, WAYNE M., D.V.M.
R.F.D. 4, Cadiz, Ohio.
MYERS, GILBERT H., JR., D.V.M.
Milton Jct., Wis.
ORR, WILLIAM G., D.V.M.
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REESER, DONALD D., D.V.M.
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ROEGE, ESTHER H., D.V.M.
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SALISBURY, JOSEPH D., D.V.M.
45 W. Weber Rd., Columbus, Ohio.
SANGER, VANCE L., D.V.M.
58 W. Lane Ave., Columbus 1, Ohio.
SMITH, GEORGE M., D.V.M.
Rt. 6, Greenville, S. Car.
STERNER, FERN E., D.V.M.
Lineboro, Md.
STEWART, KENNETH E., D.V.M.
Box 288, Leesburg, Ohio.
THOMAS, VICTOR O., D.V.M.
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TITKEMEYER, CHARLES W., D.V.M.
R.R. 1, Rising Sun, Ind.
WALKER, OLEN L., D.V.M.
60 Webster Acres, Webster Groves, Mo.
WALKER, WALDO F., D.V.M.
187 W. Cooke Rd., Columbus 2, Ohio.
WARD, BASIL D., D.V.M.
120 W. North St., Springfield, Ohio.
WARD, GEORGE B., D.V.M.
R.R. 1, Oxford, Ohio.
WHITE, GEORGE P., D.V.M.
702½ N. 6th St., Goshen, Ind.
YATES, VANCE J., D.V.M.
R.D. 1, Smithville, Ohio.
ZWEIGART, THOMAS F., JR., D.V.M.
Box 36, Aberdeen, Ohio.

Ontario Veterinary College

ARMSTRONG, HOWARD R., D.V.M.
399 Sherbrook St., Winnipeg, Man.
Vouchers: T. L. Jones and A. F. Bain.
BALDWIN, WILLIAM R., D.V.M.
R.R. 4, Hamilton, Ont.
Vouchers: A. F. Bain and T. L. Jones.
CHRISTIE, ALAN P., D.V.M.
Burk Falls, Ont.
Vouchers: T. L. Jones and J. A. Henderson.
DARLINGTON, DOUGLAS S., D.V.M.
Woodbridge, Ont.
Vouchers: T. L. Jones and J. A. Henderson.
HORSLEY, FREDERICK A., D.V.M.
1166 Laird Blvd., Apt. 17, Montreal 16, Que.
Vouchers: T. L. Jones and A. F. Bain.
MAIN, AVARD R., D.V.M.
Windsor, N. S.
Vouchers: A. F. Bain and R. A. McIntosh.
VERVILLE, GILBERT, D.V.M.
c/o Dr. M. P. Fuller, Brunswick, Ohio.
Vouchers: A. F. Bain and T. L. Jones.
WERRY, JOHN H., D.V.M.
43 Carlisle Ave., Bowmanville, Ont.
Vouchers: R. A. McIntosh and J. A. Henderson.

YOUNG, CLIFFORD L., D.V.M.
Campbellville, Ont.
Vouchers: T. L. Jones and V. R. Brown.

Texas A. & M. College

BASS, RICHARD C., D.M.V.
Box 2387, College Station, Texas.
Vouchers: A. A. Lenert and H. T. Barron.

BATTE, EDWARD G., D.V.M.
U. of Fla., Agri. Exp. Sta., Gainesville, Fla.
Vouchers: R. D. Turk and J. H. Milliff.

BEASLEY, JOSEPH N., D.V.M.
Box 27, Centerton, Ark.
Vouchers: S. S. Kreuz and A. A. Lenert.

CALLIHAM, MELVIN R., D.V.M.
2608 Ong St., Amarillo, Texas.
Vouchers: H. E. Redmond and A. A. Lenert.

CLIFFORD, ROBERT L., JR., D.V.M.
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Vouchers: R. D. Turk and A. A. Lenert.

COUGER, STEWART J., D.V.M.
Box 82, Graford, Texas.
Vouchers: S. S. Kreuz and H. E. Redmond.

COX, JOE E., D.V.M.
Box 285, Royse City, Texas.
Vouchers: A. A. Lenert and H. E. Redmond.

DUBUISSON, HERBERT J., D.V.M.
R.F.D. 3, Box 84, Beaumont, Texas.
Vouchers: H. T. Barron and H. E. Redmond.

DUNLAP, ROYAL E., D.V.M.
1019 S. Pearl, Belton, Texas.
Vouchers: A. A. Lenert and R. D. Turk.

EDWARDS, CHARLES W., JR., D.V.M.
4221 Chester, El Paso, Texas.
Vouchers: W. W. Armistead and H. E. Redmond.

FULLER, JACK P., D.V.M.
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Vouchers: H. T. Barron and R. P. Marsteller.

GIBBS, LEON W., D.V.M.
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Vouchers: J. H. Milliff and R. D. Turk.

GUPTON, JOHN W., D.V.M.
c/o Richmond Animal Hosp., Richmond, Texas.
Vouchers: W. W. Armistead and P. W. Burns.

HARGIS, RAY O., D.V.M.
Natchitoches, La.
Vouchers: W. W. Armistead and W. V. Lumb.

HOWE, RICHARD D., D.V.M.
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HUFFMAN, MAHLON B., D.V.M.
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JENKINS, DEE R., D.V.M.
Rt. 1, Box 77, Melvin, Texas.
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KARSTETER, HUGH H., D.V.M.
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Vouchers: A. A. Lenert and W. V. Lumb.

KELTY, CECIL D., D.V.M.
Box 402, Clarksville, Texas.
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LOVE, CHARLES R., D.V.M.
Frederick, Okla.
Vouchers: H. T. Brown and A. A. Lenert.

PATTERSON, JAMES W., D.V.M.
Rt. 5, Henderson, Texas.
Vouchers: A. A. Lenert and W. W. Armistead.

PERKINS, LEWIS JR., D.V.M.
Box 2736, College Station, Texas.
Vouchers: V. B. Robinson and H. T. Barron.

PRICE, ALVIN A., D.V.M.
Box 726, College Station, Texas.
Vouchers: H. T. Barron and A. A. Lenert.

RIDDLE, ROYCE D., D.V.M.
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Vouchers: A. A. Lenert and R. D. Turk.

ROGERS, HERBERT, D.V.M.
129 State St., Stamps, Ark.
Vouchers: W. W. Armistead and H. T. Barron.

SAMPLE, JOSEPH M., D.V.M.
Box 1367, College Station, Texas.
Vouchers: A. A. Lenert and J. F. Milliff.

SEARS, ALEC C., D.V.M.
Box 1278, College Station, Texas.
Vouchers: A. A. Lenert and W. W. Armistead.

SWAIM, JOHN C., D.V.M.
1316 S. Broad St., New Orleans, La.
Vouchers: H. T. Barron and J. H. Milliff.

TICKLE, ANDREW J., D.V.M.
Concho, Texas.
Vouchers: R. D. Turk and W. W. Armistead.

TURNER, WILLIE J., D.V.M.
Sabinal, Texas.
Vouchers: H. E. Redmond and A. A. Lenert.

WADDELL, EARL D., D.V.M.
4310 Almeda St., Houston, Texas.
Vouchers: R. D. Turk and H. T. Barron.

WARING, HENRY C., D.V.M.
5311 Mulford, Houston 3, Texas.
Vouchers: R. D. Turk and J. H. Milliff.

WHITE, TROY C. D.V.M.
P.O. Box 1946, College Station, Texas.
Vouchers: H. E. Redmond and H. T. Barron.

WILLIS, EUGENE A., D.V.M.
General Delivery, Llano, Texas.
Vouchers: H. E. Redmond and W. W. Armistead.

WILSON, ROY L., D.V.M.
LaGrange, Texas.
Vouchers: H. T. Barron and W. V. Lumb.

WITTER, GEORGE W., D.V.M.
436 Warwick Blvd., San Antonio, Texas.
Vouchers: H. T. Barron and A. A. Lenert.

State College of Washington

ANDERSON, LEE M., D.V.M.
N. 806 Main St., Colfax, Wash.
Vouchers: E. E. Wegner and L. W. Groves.

BATES, ROBERT M., D.V.M.
Stanwood, Wash.
Vouchers: J. R. Dinsmore and P. A. Klavano.

BELLER, GEORGE I., D.V.M.
2640 Live Oak, Huntington Pk., Calif.
Vouchers: E. E. Wegner and D. R. Cordy.

BOGART, ELMER P., D.V.M.
1819 C. St., Pullman, Wash.
Vouchers: E. E. Wegner and J. R. Dinsmore.

BUDURIN, ALEXANDER A., D.V.M
1227 N. Santa Rita, Tucson, Ariz.
Vouchers: D. R. Cordy and L. W. Groves.

BUSTAD, LEO K., D.V.M.
1400 Maiden Lane, Pullman, Wash.
Vouchers: D. R. Cordy and J. R. Dinsmore.

CHUDACOFF, JOHN D., D.V.M.
4220 S. Kenwood Ave., Los Angeles 37, Calif.
Vouchers: F. P. Wilcox and J. R. Dinsmore.

CUNNINGHAM, NORMAN E., D.V.M.
Rt. 5, Box 280, Bakersfield, Calif.
Vouchers: D. R. Cordy and J. R. Dinsmore.

DIAMOND, EDWARD, D.V.M.
314 26th Ave., Seattle 22, Wash.
Vouchers: L. W. Groves and E. E. Wegner.

DRAKE, MARILYN F., D.V.M.
Rt. 1, Box 229, Selah, Wash.
Vouchers: E. E. Wegner and L. W. Groves.

HALSTEAD, JAMES R., D.V.M.
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HANSEN, ARNE G., D.V.M.
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HELFER, DONALD H., D.V.M.
Box 353, Tillamook, Ore.
Vouchers: E. E. Wegner and E. C. Stone.

HILL, DAVID A., D.V.M.
Tacoma Veterinary Hosp., Tacoma, Wash.
Vouchers: H. R. Zimet and E. E. Wegner.

HONSINGER, FRED S., D.V.M.
3025 Bateman St., Berkeley 5, Calif.
Vouchers: E. E. Wegner and W. L. Meyers.

HUMPHREY, GEORGE L., D.V.M.
605 6th St., Petaluma, Calif.
Vouchers: J. R. Dinsmore and J. E. McCoy.

KERR, ELDRED E., D.V.M.
2015 *N.* Fourth St., Coeur d' Alene, Idaho.
Vouchers: E. C. Stone and L. W. Groves.

KITTLESON, LOREN L., D.V.M.
1531 Rainier Ave., Everett, Wash.
Vouchers: J. E. McCoy and L. W. Groves.

LARSEN, AUSTIN E., D.V.M.
2572 Fillmore Ave., Ogden, Utah.
Vouchers: E. C. Stone and P. O. Klavano.

LARSEN, LOUIS, D.V.M.
345 Glendale Rd., San Mateo, Calif.
Vouchers: E. E. Wegner and L. R. Montgomery.

LAWSON, ROBERT C., D.V.M.
697 Pettis Ave., Mountain View, Calif.
Vouchers: E. E. Wegner and D. R. Cordy.

LAYTON, ROBERT S., D.V.M.
309½ W. Main, Pullman, Wash.
Vouchers: E. E. Wegner and J. E. McCoy.

MORSE, HERBERT C., D.V.M.
Hillsboro Veterinary Hosp., Hillsboro, Ore.
Vouchers: E. C. Stone and J .E. McCoy.

MOULTON, JACK E., D.V.M.
4346 Pasadena Pl., Seattle, Wash.
Vouchers: D. R. Cordy and L. W. Groves.

NICHOLLS, MAXWELL D., D.V.M.
Rt. 1, Box 537, Renton, Wash.
Vouchers: P. A. Klavano and J. R. Gorham.

PRUYN, EARL M., D.V.M.
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Vouchers: E. E. Wegner and E. C. Stone.

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Vouchers: E. E. Wegner and J. E. McCoy.

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Vouchers: E. E. Wegner and J. R. Dinsmore.

SHAFFNER, DON K., D.V.M.
Dillon, Mont.
Vouchers: L. R. Montgomery and L. W. Groves.

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STAPP, RICHARD W., D.V.M.
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UNDERWOOD, ROBERT E., D.V.M.
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Vouchers: L. W. Groves and D. R. Cordy.

WASSON, DONALD Q., D.V.M.
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Vouchers: E. E. Wegner and L. W. Groves.

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WAYLAND, FRANK W., D.V.M.
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WEINER, CHARLES, D.V.M.
c/o Dr. Seth Lau, Box 241 V, Alta Hill, Grass Valley, Calif.
Vouchers: E. E. Wegner and D. R. Cordy.

WELCH, W. J., D.V.M.
Box 513, Haines, Ore.
Vouchers: E. E. Wegner and J. E. McCoy.

WONG, DONALD H., D.V.M.
1004-A Maunaihi Pl., Honolulu 25, T.H.
Vouchers: E. E. Wegner and L. R. Montgomery.

Second Listing

Kansas State College

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CHAFFEE, GEORGE H., D.V.M., 44 A. Hilltop Cts., Manhattan, Kan.

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MERRITT, DOUGLAS N., D.V.M., Atchison, Kan.
MERSKY, HAROLD A., D.V.M., Woodbine, N. J.
OBRECHT, MARTIN A., D.V.M., Harlan, Iowa.
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ELLIOT, HENRY G., D.V.M., 500 Georgia Ave., Jacksonville, Texas.
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MCCARTY, ROBERT T., D.V.M., 1408 Harrington Ave., Fort Worth, Texas.
PACHAR, MAX A., D.V.M., 530 Russell Cts., Orange, Texas.
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AMONG THE STATES AND PROVINCES

Alabama

Conference for Veterinarians.—The twenty-fifth annual conference for veterinarians of the School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, was held at the School on June 7-9, 1949. The literary program follows.

Dr. W. F. Riley, Jr., Department of Surgery and Medicine, Michigan State College, East Lansing: "Paravertebral Nerve Block."

Dr. G. R. Moore, Department of Surgery and Medicine, Michigan State College, East Lansing: "Blood Transfusion in Cattle" and "The Problem of Retained Placenta in Cattle."

Dr. R. P. Knowles, Miami, Fla.: "Intratracheal Gas Anesthesia" and "Clinical Laboratory Interpretations."

Drs. W. O. Brinker, Department of Surgery and Medicine, Michigan State College; D. A. Smith, Department of Veterinary Medicine, Iowa State College, Ames; and N. D. Crandall, J. E. Greene, and B. F. Hoerlein of the Alabama School of Veterinary Medicine faculty: "Fracture Reduction Demonstration."

Dr. W. J. Gibbons: "Cirrhosis of Liver in Horses" (with illustrations).

Dr. F. H. Manley: "The Newcastle Problem" (with illustrations).

Dr. A. H. Quin, Jensen-Salsbery Laboratories, Inc., Kansas City, Mo.: "A Review of Observations on Swine Disease."

Dr. George H. Hopson, consulting veterinarian, De Laval Co., New York, N. Y.: "Responsibility of the Veterinarian in Mastitis Control."

Col. Frank M. Lee, V.C., U. S. Army, Fort Benning, Ga.: "Service with the Army Veterinary Corps."

Dr. D. A. Porter, parasitologist, Regional Animal Disease Research Laboratory, Auburn: "Internal Parasites of Cattle" (with illustrations).

Dr. R. W. Engel (Ph. D.) nutritionist, Animal Industry Department, Alabama Polytechnic Institute: "Protein Metabolism."

Dr. D. A. Smith: "Use of Intramedullary Bone Pins in Fracture Reduction."

Dr. W. O. Brinker: "Treatment of Traumatic Injuries."

Drs. Gibbons, Crandall, Hoerlein, and Manley are members of the faculty of the Alabama Polytechnic Institute, School of Veterinary Medicine.

s/R. S. SUGG, *Dean.*

Colorado

Chinchilla.—The report of the National Chinchilla Show at Denver, in January, reveals that there are only 43,222 chinchillas in the United States, and that 26,000 of these are breeding pairs selling from $800 to $1,650 each. In other words, the chinchilla industry still lingers in the breeding stock phase, promising as the industry appears to be. The show drew overflowing crowds—a total of 25,000. To be remembered is that there are no chinchilla pelts on the market and there will not be any for several years, the 638 (mostly breeders) who attended the banquet were told.

Delaware

Spring Meeting.—Twenty members of the Delaware Veterinary Medical Association were guests of Drs. H. L. Fell and E. A. Webb at Dr. Webb's farm in Avondale, Pa., on May 27. The program included a tour of the King Ranch where the group observed the results of the extensive cattle and horse-breeding experiments for which the King Ranch is widely known.

An evening of social activities climaxed the meeting.

s/C. C. PALMER, *Resident Secretary.*

Georgia

Personal.—Dr. and Mrs. James H. Steele have established a home at 167 Old Ivy Road, N. E., Atlanta. Mrs. Steele, who has been hospitalized for the past seven years with pulmonary tuberculosis at Lansing, Mich., is now discharged as an arrested case, and her health is improving steadily.

s/JAMES H. STEELE.

Illinois

Chicago Association.—The Chicago Veterinary Medical Association met May 10, 1949, at the Stevens Hotel. Mr. Herman H. Henkle, director of the John Crerar Library, discussed the function and purpose of the library; and Major W. S. Gochenour, Jr., V.C., told of his experiences in China and of the veterinary problems there.

The ladies were entertained with a special program on millinery art.

s/R. C. GLOVER, *Secretary.*

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Dr. W. A. Young Honored.—Dr. W. A. Young (ISC '19), Oak Park, managing director of The Anti-Cruelty Society, Chicago, and treasurer of the AVMA, received the Alumni Merit Award from the Iowa State College at the commencement exercises on June 11, 1949.

Dr. W. A. Young

This is the highest honor bestowed upon alumni by this institution. It was granted "In recognition of preëminent service in advancing human welfare."

While at the College, Dr. and Mrs. Young visited their son, Robert, a ceramic engineering student.

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University of Illinois Matriculation.—A bill was introduced into the state legislature, which would require the College of Medicine, of the state university, to admit three residents of each senatorial district to each freshman class, in lieu of crowding the student bodies with nonresidents.

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Dr. Lantis Featured in Article.—An article in *Prairie Farmer,* (May, 1949), featuring Dr. C. W. Lantis, Adams County, Ill., depicts some of the daily duties of the veterinarian. Dr. Lantis is shown immunizing hogs against cholera and erysipelas; administering penicillin for mastitis; and drenching a cow. "Every animal and fowl on the farm is worth a lot in terms of dollars today, and the capable veterinarian is performing a valuable service in saving them from sickness and death. Truly, veterinarians are some of the farmer's best friends."

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Antituberculosis Vaccine Unit.—The groundbreaking ceremony for the Institution of Tuberculosis Research at the Chicago Medical

Center on May 20, in the presence of Governor Stevenson, Mayor Kennelly, and prominent figures of the medical profession, was announced in the press as a signficant step toward a more general application of BCG in the United States, under controlled programs such as the Chicago Municipal Tuberculosis Sanitarium has been conducting for the past fifteen years. The vaccinal program of the Chicago phthisiologists has attracted worldwide attenion.

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Doping Allegedly Rampant at Chicago Tracks.—The Illinois Racing Commission has taken summary action against horse trainers recently found guilty of doping horses with coramine or caffeine at Lincoln Fields and Sportsman's Park. Indefinite suspension was meted out to the dopesters on evidence provided by the saliva test. Involved are four trainers, a groom, and three owners, together with an unmentioned number of horses. Lest we forget, coramine is a proprietary remedy, medicinally comparable to picrotoxin and metrazol, stimulating respiration by way of the central nervous system. The estimation of these in the racing circles seems to need revision. They do prop the depressed nerves but it is indeed doubtful that they spur normal nervous system to advantage.

Iowa

Eastern Iowa Clinic.—On May 26, 1949, the Eastern Iowa Veterinary Association held its fifteenth annual all-day practitioners clinic at the Dairy Cattle Congress Hippodrome in Waterloo. Sponsored and managed by the Cedar Valley branch, the list of committee members, section officers, and participants reads like a "Who's Who" of the veterinarians of Iowa.

A review and discussion of the clinic cases, which included contracted tendons in a colt, bovine and porcine cesarean section, x disease, Newcastle disease vaccination, and others too numerous to mention here, will be presented at the annual meeting of the Eastern Iowa Veterinary Association in Cedar Rapids on Oct. 20-21.

s/LAURANCE P. SCOTT, *Secretary.*

• • •

Poultry Dealers Training School.—The empiricism that provides medical care for animals, where professionalism fails to do so, has no less punch than it had before colleges of veterinary medicine were established. In fact, its thrift remains phenomenal. Dr. Salsbury's Laboratories at Charles City, for one example, are too thrifty for the most optimistic professional to laugh off. It has just finished its 158th curriculum for dealers in poultry remedies. There were 41 students from 13 states in the last class, all the way from Delaware in the east to southwestern Texas and Utah to the west. The courses consist of lectures on poultry-disease research and clinical demonstrations for the edification of laymen on a branch of veterinary medicine that was too long postponed by our educational system and clinical service—while a disease-ridden, $3 billion poultry industry was developing unnoticed.

East Central Society.—Forty-eight veterinarians from 15 counties attended the dinner meeting of the East Central Iowa Veterinary Medical Society on May 12, 1949. Dr. F. A. Malloy, Cascade, spoke on "The Control of Swine Erysipelas." Drs. J. C. Carey and J. W. Carey, West Liberty; S. G. Paul, Clarence; H. E. Hanna, Springville; A. R. Stephenson, Bennett; E. A. Rolston, Clinton; V. M. Reinhart, Norway; J. M. Hood, Durant; and D. P. Marek, Maquoketa, participated in a discussion on this subject. Federal veterinarian, Dr. Joe W. Giffee, Cedar Rapids, and Dr. Darrell T. White, Williamsburg, gave case reports on swine erysipelas.

Dr. Warren E. Bowstead, Lowden, reported on a suspected case of X disease in a cow, and Drs. Frank M. Wilson, Mechanicsville; Tom T. Bowstead, Riverside; Wayne H. Thompson, Earlville; D. P. Marek, Maquoketa; and John B. Bryant, Mount Vernon, discussed the report.

s/E. C. HOWE, *Secretary.*

Kansas

Conference for Veterinarians.—The eleventh annual conference for Kansas veterinarians was held at the School of Veterinary Medicine, Kansas State College, Manhattan, June 9-10, 1949. The scientific program follows:

Dr. F. W. Atkeson (Ph. D.), Department of Dairy Husbandry, Kansas State College: "The Artificial Breeding Program in Kansas."

Dr. C. P. Zepp, Sr., president-elect of the AVMA, New York, N. Y.: "Obstinate Skin Diseases of Dogs" and "Diagnosis and Treatment of Ear Diseases, Including Surgery" (both illustrated).

Dr. E. A. Tunnicliff, pathologist, Veterinary Research Laboratory, Agricultural Experiment Station, Bozeman, Mont.: "Mastitis in Ewes" and "Virus Diseases of Sheep." Drs. T. P. Crispell and L. M. Roderick led the discussion of the first paper.

Dr. Glynden T. Easley: "Reasons for Failure of Conception Following Artificial Insemination."

Dr. I. Forest Huddleson, School of Veterinary Medicine, Michigan State College, East Lansing: "Treatment of Brucellosis" and "Mucoid Brucellosis Vaccines."

Drs. F. H. Oberst and J. D. Wheat: "Bovine Mastitis."

Dr. G. K. L. Underbjerg: "Nutrition for Farm Animals."

Dr. L. D. Bushnell: "Newcastle Disease."

Drs. C. H. Kitselman, R. D. Barner, C E. Rehfeld, E. J. Splitter, and J. D. Wheat: "Clinical Tests."

Dr. James A. Austin (Ph.D.), chief chemist, Jensen-Salsbery Laboratories, Kansas City, Mo.: "Recent Developments in the Field of Pharmacy and Therapeutics."

Drs. Roderick, Barner, Kitselman, Rehfeld, Splitter, Underbjerg, Bushnell, Oberst, and Wheat are members of the faculty of the School of Veterinary Medicine, Kansas State College.

s/E. E. LEASURE, *Dean.*

Maine

The New England Association.—The annual meeting of the New England Veterinary Medical Association will be held at the luxurious Poland Spring House, at Poland Spring, Oct. 18-19, 1949. The NEVMA, like the Tri-State, Mississippi Valley, Southern, and Northwestern, is one of the influential regional veterinary societies. Its founding father, and past-president of the AVMA, was the late Harry Jakeman of Boston. The president is A. E. Coombs (UP '31) of Skowhegan, who writes: "Plans are being made for a superb convention."

Mississippi

The first day's session of the forty-third annual meeting of the Mississippi Veterinary Medical Association in Laurel, on Jan. 20-21, 1949, was climaxed with a banquet in the dining room of the Pinehurst Hotel. Shown (left to right) are: Dr. A. H. Groth, Auburn, Ala.; Mrs. Ben Huston, Laurel; Dr. Ben S. Huston, president; Dr. S. A. Cox, secretary-treasurer, Jackson; Mrs. S. A. Cox; Dr. R. C. Klussendorf, Chicago, Ill.; and Mrs. R. C. Klussendorf.

The Women's Auxiliary to the Mississippi State Veterinary Medical Association was organized at the state meeting of the Association, Jan. 20-21. Shown here are (left to right): Mrs. L. D. Johnson, vice-president, Picayune; Mrs. Ben Huston, Laurel; Mrs. R. C. Klussendorf, Chicago, Ill.; Mrs. S. A. Cox, treasurer, Jackson; and Mrs. J. P. Carney, president, Meridian.

Missouri

Kansas City Association.—On May 17, 1949, the Kansas City Veterinary Medical Association met at the Hotel Continental. Dr. D. O. Wendt was moderator of a panel discussion "Review of Practical Obstetrics". Other panel members were Dr. E. Dickey, "Bovine Obstetrics"; Dr. E. Ebert, "Equine Obstetrics"; and Dr. J. Farney "Small Animal Obstetrics". A fall program will be devoted to swine obstetrics.

Members of the association and their families enjoyed a picnic at Dr. Joe Knappenberger's farm, June 3, 1949.

s/EARL L. MUNDELL, *Secretary.*

Ohio

Veterinary College Open House.—Farm and Home Week has been a fixture on the campus of the Ohio State University for many years,

—O.S.U. Dept. of Photography

Staff member examining animal with permanent rumen fistula, preparatory to permitting spectators to look inside.

but the College of Veterinary Medicine participated for the first time in 1949. In a sense, this "open house" stole the show by drawing more visitors and stimulating more discussion than any other exhibit.

The theme of the exhibit emphasized the value of early diagnosis and surgical treatment of dairy cattle suffering from traumatic gas-

—O.S.U. Dept. of Photography

These animals were saved by surgery. The card says: "Hardware Kills Many Cattle. These animals were saved by alert cattlemen. Successful cattlemen note the following abnormalities at the outset: (1) off feed, (2) sudden drop in milk production, (3) stiff, painful, cautious movement. Prompt veterinary diagnosis and surgery is essential if these animals are to be saved."

tritis. Recovered animals were exhibited in bunting-draped stalls, and 1 animal with a permanent rumen fistula was on display, so that visitors could see the movement of the rumen contents in response to contraction of the muscular walls.

s/W. R. KRILL, *Dean.*

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Conference for Veterinarians.—The eighteenth annual conference for veterinarians of the College of Veterinary Medicine and the Diamond Jubilee Celebration (celebrating the 75th anniversary of The Ohio State University) were held June 15-17, 1949, at the University in Columbus. The literary program follows.

Dr. M. W. Allam, associate professor of veterinary surgery, College of Veterinary Medicine, University of Pennsylvania, Philadelphia: "Perineal Herniorrhaphy" (with colored illustrations) and "Foreleg Paralysis of the Dog Following Trauma."

Dr. Leonard J. Goss, veterinarian, Zoölogical Park, Bronx Park, New York, N. Y.: "Zoö logical Park Veterinary Problems" (with colored illustrations).

Dr. J. R. M. Innes, Chemical-Biological Coordination Center, Washington, D. C.: "The relation of Distemper Infection to the Etiology of Canine Encephalopathies."

Dr. C. Roger Smith: "Streptomycin Concentration in the Urine and Blood of the Dog."

Dr. W. A. Young, managing director, The Anti-Cruelty Society, Chicago, Ill.: "Feline Restraint and Medication."

Dr. Jacob Jay Jacoby, director of anesthesia, College of Medicine, The Ohio State University: "The Use of Anesthetics in the Dog."

Dr. James C. Munch, president, Munch-Research Laboratoriies, Inc., Upper Darby, Pa.: "Toxicology in Canine Practice."

Dr. J. A. Myers (M.D.), Division of Internal Medicine, The Medical School, University of Minnesota, St. Paul: "The Contribution of the Veterinary Profession to Public Health."

Dr. J. K. Loosli (Ph. D.), Department of Animal Husbandry, Cornell University, Ithaca, N. Y.: "Important Essentials of Dairy Cattle Nutrition."

Dr. W. E. Krauss (Ph. D.), associate director of the Ohio Agricultural Experiment Station, Wooster: "Feeding and Management of Dairy Calves."

Mr. C. F. Monroe, Department of Dairy Industry, the Ohio Agricultural Experiment Station: "Feeding the Dairy Heifer."

Dr. C. F. Huffman (Ph. D.), Department of Dairying, Michigan State College, East Lansing: "Feeding the Milking Herd."

Mr. J. W. Hibbs: "Fundamentals of Metabolic Disturbances of Dairy Cattle."

Dr. G. W. Salisbury (Ph. D.), Department of Dairy Production University of Illinois, Urbana: "Importance of Nutrition and Management in the Performance of the Breeding Bull."

Dean W. R. Krill, and Drs. J. K. Loosli, W. E. Krauss, C. F. Monroe, T. S. Sutton, C. F. Huffman, G. W. Salisbury, J. W. Hibbs, and F. Ely of the faculty of the College of Veterinary Medicine, presented a panel discussion on "Conditions Affecting the Dairy Cow."

Dr. V. L. Tharp: "Cases from the Veterinary Clinic (with illustrations).

Dr. F. B. Young, Waukee, Iowa: "Diseases of Beef Cattle" and "Obstetrics of Swine."

Drs. C. R. Cole, H. E. Amstutz, C. D. Diesem, V. L Tharp, and J. H. Gainer participated in a symposium on "The Ocurrence of New Diseases in Ohio."

Graduating Class, New York State Veterinary College, Cornell University

First row (left to right)—C. H. Frederick, S. Glick, B. R. Dickinson, D. F. Buckley, Dr. E. P. Leonard, Dr. M. G. Fincher, Dr. J. N. Frost, Dr. A. M. Mills, Dr. D. W. Baker, M. Osgood, J. L. Williamson, A. W. Miller, W. F. Schmitt, Dr. H. C. Stephenson.

Second row—T. Hsia, H. F. Anderson, R. A. Goldman, W. A. Greene, A. S. Cosgrove, B. J. Cohen, H. H. Quimby, J. R. Wheaton, W. E. Taylor, A. J. Blaney, P. H. McEnerney, R. E. Vargoshe, R. E. Reddick, M. M. Fagan, R. C. Lunna, D. C. Dingley.

Third row—J. E. McCormick, H. C. Wang, W. P. Darrow, M. Shapiro, R. F. Burchard, M. F. Smith, W. H. Keaton, R. H. White, D. E. Webster, I. Yasgur, L. A. Baker, W. I. Jensen, G. C. Christensen, W. H. Daniels, F. L. Davis, G. M. Ward, K. R. Reinhard.

Dr. F. R. Koutz: "Avian Cecal Coccidiosis" (with colored illustrations). Dr. F. Fenstermacher, veterinarian in charge, Diagnosis Laboratory, Division of Veterinary Medicine, University of Minnesota, St. Paul: "Subtypical Hog Cholera."

Drs. C. R. Smith, Tharp, Cole, Amstutz, Diesem, Gainer, Koutz and Mr. Hibbs are members of the faculty of the College of Veterinary Medicine, The Ohio State University.

s/W. R. KRILL, *Dean.*

Ontario

Death of Doctor Grenside.—This province lost a famous veterinarian and horseman in the death of Dr. F. C. Grenside (ONT '79), 94, at his home in Guelph, May 11, 1949. He was a native son, born at Hamilton, Jan. 30, 1855, and received his preliminary and professional education within his province. After graduating from the Ontario Veterinary College, he entered practice with Dr. A. S. E. Grange at Guelph. Noted for exporting and importing fancy horses, he was a capable judge of events in Toronto, New York City, Boston, and Chicago. He practiced in New York City from 1894 to 1910. In the heyday of his professional life, few veterinarians in America were more widely or more favorably known in the profession and horseshow circle than was Frederick Clement Grenside.

He survived his wife, *née* Adelaide Louisa Gross, and left a daughter, Mrs. Grant Turner of Manitoulin Island, to mourn the passing of her distinguished father.—L. A. M.

Pennsylvania

Keystone Association.—The Keystone Veterinary Medical Association met May 25, 1949, at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia. Dr. Jacques Jenny, spoke on "Modification of Kirschner Pinning of Fractures" and "Highlights of the AAHA Convention."

s/RAYMOND C. SNYDER, *Secretary.*

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Bucks-Montgomery and Schuylkill Valley Associations—The Bucks-Montgomery and Schuylkill Valley Veterinary Medical associations met at the Berkshire Hotel in Reading on May 18, 1949. Speaker of the evening was Dr. R. A. Kelser, dean, University of Pennsylvania School of Veterinary Medicine.

At the meeting of the Bucks-Montgomery Association at the Moose Home in Doylestown on June 8, Dr. J. J. Thomas, meat inspector, Pennsylvania Bureau of Animal Industry, spoke on "Meat Inspection in Pennsylvania."

s/J. G. SHUTE, *Secretary.*

Washington

Northwestern Laboratories Headed by Dr. Hummon.—Dr. O. J. Hummon (OSU '30), formerly with the U.S. Department of Interior, in charge of fur animal disease research at Pullman, Wash., helped to set up the Northwestern Laboratories and veterinary service at Auburn. U.S. Veterinary License No. 217 has been issued for production of distemper vaccine-mink (mink origin) by the U.S. Bureau of Animal Industry, Virus Serum Control Division, Washington, D. C.

Located 20 miles south of Seattle and 4 miles northwest of Auburn, Northwestern Laboratories are isolated from adjacent fur-raising activities and canine concentrations often found hazardous in city locations, and are afforded greater disease prevention in the production of vaccine and the hospitalization of sick mink.

A routine vaccination program has been formulated and is in effect on many mink farms for the prevention of mink distemper.—*The National Fur News, May,* 1949.

Wisconsin

Milwaukee Association.—The Milwaukee Veterinary Medical Association met in the lecture hall of the Wisconsin Humane Society on May 17, 1949. Dr. D. L. Lichty, U. S. Public Health Service, Madison, discussed "Veterinary Public Health and the Practitioner." Dr. Lichty is assigned to the State Board of Health and is now engaged in field work in brucellosis.

s/K. G. NICHOLSON, *Secretary.*

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Brucellosis Committee Poll.—The Special Brucellosis Committee of the Wisconsin Veterinary Medical Association polled all Wisconsin veterinarians on the following questions with the results noted:

1) Do you favor sending all blood for brucellosis to the State Laboratory?— 65 yes; 168 no.

2) Do you favor sending all blood for brucellosis testing for interstate shipment and auctions only?—95 yes; 105 no.

3) Do you favor sending all blood to the laboratory for testing except calf vaccination? —20 yes; 175 no.

s/J. O. MCCOY, *Secretary.*

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Northern Association.—The spring meeting of the Northern Wisconsin Veterinary Medical Association was held at Mishicot, on May 19, 1949. After the program, members were entertained at the banquet and motion picture.

s/WILLIAM MADSEN, *Secretary.*

FOREIGN NEWS

India

Request for Journals.—The following letter was received from Principal Aggarwala of the new Veterinary College in Hissar, Punjab:

> This College is opened since 15-2-1949 after partition of the Province of the Punjab. We have been regularly getting your esteemed Journal since then.
>
> I, however, feel that this College should have a complete set of all the previous issues and volumes in its Library. Can you give us the same free of all cost? If you cannot, please let me know what you would charge if a complete set of the previous eight volumes is ordered through proper channels.

Major A. C. Aggarwala, East Punjab Vet-

erinary College, Hissar, Punjab, India.

The AVMA is unable to supply back issues of the Journal as the demand has been so heavy that the reserves are very low. Members who may wish to contribute back issues may send them directly to Major Aggarwala at the address given.

Japan

Spring Meeting.—The Japanese Society of Veterinary Science (Nippon Jui Gakkai) held its 25th meeting at the Tokyo University on April 10-11, 1949. Approximately 200 members, from every part of the country, attended the meeting, at which 108 papers were presented. Other papers prepared for this meeting, but not presented because of lack of time, will be presented when the October session convenes. Of particular interest to members were the reports on equine infectious encephalitis which is the subject of intensive research at the Department of Agriculture, Tokyo University.

s/KENNETH F. BURNS,
Major, V.C., U.S. Army

Trinidad

Rabies in Fruit-Eating Bats.—Although suffering from rabies of a nonfatal, inapparent form, the blood-sucking vampire bats of this island have long been known for transmitting rabies to man and animals; whereas, the fruit-eating Artibeus bat was thought to be harmless. However, Pawan (Abstr. *J.Am.M.A.*, March 5, 1949: 676) has shown that the fruit-eating variety, when rabid, will pounce upon passing animals from fruit trees and inoculate them with rabies virus.

STATE BOARD EXAMINATIONS

Minnesota—The Veterinary Examining Board of the State of Minnesota will hold examinations on July 12-13, 1949, at the State Capitol, Saint Paul, Minn., beginning at 8 a.m. each day.

Utah—The Utah State Veterinary Examining Board will conduct an examination on Aug. 8-9, 1949, at the State Capitol Building, Salt Lake City. A $15 registration fee and a diploma from a recognized veterinary college must be submitted with the application. For further information and application blanks, address Mrs. Rena B. Loomis, Department of Registration, State Capitol Building, Salt Lake City, Utah.

USPHS Examination—An examination for regular Corps Veterinary Officers in the U.S. Public Health Service will be held Sept. 26-Oct. 7, 1949, at locations to be announced later.

VETERINARY MILITARY SERVICE

Officers Promoted.—Announcement is made of the appointment in the Regular Army, V. C., in the grade of 1st lieutenant w/rank from January 1, 1949, of the following veterinary officers now on active duty, effective April 20, 1949:

William D. Nettles, Major-AUS, Camp Lee, Va.

Samuel K. Kirk, Captain-AUS, Presidio of San Francisco, Calif.

William A. Rader, Jr., Captain-AUS, 476th VFID, Percy Jones General Hospital, Battle Creek, Mich.

Glenn A. Washburn, Captain-AUS, Far East Command.

DEATHS

★**Channing R. Blatchford** (MSC '26), 45, Battle Creek, Mich., died April 16, 1949. Dr. Blatchford had been active in small animal practice in Battle Creek for more than twenty years, and was a member of the AVMA for twenty-one years.

John C. Booker (ONT '87), Cuba, Mo., died in 1949. Dr. Booker had retired from practice some time ago.

★**James T. Dolan** (UP '12), 66, Pearl River, N. Y., died May 24, 1949. Prior to his retirement in 1948, Dr. Dolan had been associated with the Lederle Laboratories Division, American Cyanamid Co., for twenty-eight years. He was in charge of the hog-cholera serum production until 1942, when he began work on pneumonia serum in the Animal Industry Section. Before coming to New York in 1920, Dr. Dolan was in meat inspection service for the U. S. Bureau of Animal Industry.

Surviving are his wife, Josephine and a brother, Andrew. Dr. Dolan was admitted to the AVMA in 1918.

Thos. Easen, Wilkes Barre, Pa., died in August, 1948. Dr. Easen had been a member of the AVMA.

Herman Elgart (UP '16), Philadelphia, Pa., died in 1949. Dr. Elgart had been employed by the U. S. Bureau of Animal Industry.

F. C. Grenside (ONT '79), 94, Guelph, Ont., died on May 11, 1949, at his home. An obituary appears under Ontario in the state news.

R. C. Grubb (ST JOS '23), Wilber, Neb., died April 2, 1949.

★**Jesse Hayes** (GEO WASH '14), 68, Fairfax, Va., died April 10, 1947. Dr. Hayes was admitted to the AVMA in 1915.

★**D. F. Hinckley** (KCVC '09), 61, Watonga, Okla., died early in 1949. Dr. Hinckley was a member of the Oklahoma Veterinary Medical Association and of the AVMA.

★**Floyd E. Myers** (ONT '12), 62, Gladwin, Mich., died on March 13, 1949. Dr. Myers was a member of the Michigan Veterinary Medical Association and of the AVMA.

Charles B. Teel (IND '15), Arcola, Ill., died April 9, 1949. Dr. Teel had retired from active practice.

Harry P. Waddle (KCVC '10), Washington, D. C., died Nov. 12, 1948. Dr. Waddle had been a member of the AVMA.

★**Ross L. Whitaker** (MC K '17), 59, Fayetteville, Tenn., died early in 1949. A member of the Tennessee Veterinary Medical Association, Dr. Whitaker was admitted to the AVMA in 1928.

★Indicates members of the AVMA.

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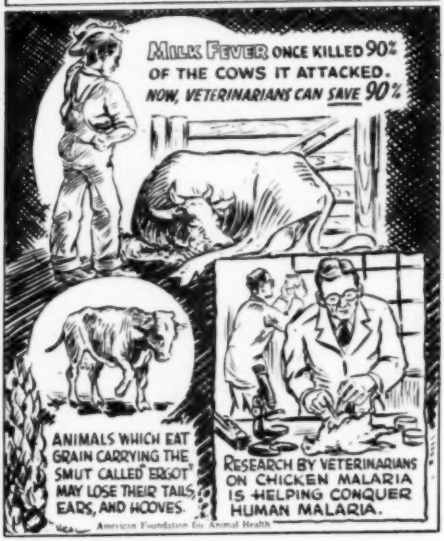
LIVESTOCK HEALTH ODDITIES


MILK FEVER ONCE KILLED 90% OF THE COWS IT ATTACKED. NOW, VETERINARIANS CAN SAVE 90%
ANIMALS WHICH EAT GRAIN CARRYING THE SMUT CALLED ERGOT MAY LOSE THEIR TAILS, EARS, AND HOOVES.
RESEARCH BY VETERINARIANS ON CHICKEN MALARIA IS HELPING CONQUER HUMAN MALARIA.
American Foundation for Animal Health

COMING MEETINGS

American Veterinary Medical Association. Annual convention. Book-Cadillac and Statler Hotels, Detroit, Mich., July 11-14, 1949. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Maine Veterinary Medical Association. Quarterly meeting. Portland, Maine, July 13, 1949. S. W. Stiles, Falmouth Foreside, Maine, secretary.

Ontario Veterinary Association. Annual summer meeting and conference for veterinarians. July 21-22, 1949. Ontario Veterinary College, Guelph, Ont. T. Lloyd Jones, Ontario Veterinary College, Guelph, Ont., secretary.

Kentucky Veterinary Medical Association. Summer meeting. Seelbach Hotel, Louisville, Ky., Aug. 17-18, 1949. Ross Brown, University of Kentucky, Lexington, Ky., secretary.

Georgia Coastal Plain Experiment Station. Annual short course for veterinarians. Coastal Plain Experiment Station, Tifton, Ga., Sept. 12-13, 1949. Wm. L. Sippel, Georgia Coastal Plain Experiment Station, Tifton, Ga.

Virginia Veterinary Medical Association. Fall meeting. Cavalier Hotel, Virginia Beach, Va., Sept. 12-14, 1949. H. K. Royer, Lynchburg, Va., secretary.

Colorado State Veterinary Medical Association. Annual meeting. Shirley Savoy Hotel, Denver, Colo., Sept. 29-30, 1949. W. P. Blake, 2410 8th Ave., Greeley, Colo., secretary.

South Dakota Veterinary Medical Association. Annual meeting. Sioux Falls, S. Dak., Oct. 5-6, 1949. R. M. Scott, 1501 S. Maine Ave., Sioux Falls, S. Dak., secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Bedford Springs Hotel, Bedford Springs, Pa., Oct. 5-7, 1949. Raymond C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Purdue University. Annual short course for veterinarians. Department of Veterinary Science, Lafayette, Ind., Oct. 5-7, 1949. C. R. Donham, head, Department of Veterinary Science, Purdue University, Lafayette, Ind.

Chief Livestock Sanitary Officials. National Assembly. The Neil House, Columbus, Ohio, Oct. 10-11, 1949. Dr. C. F. Clark, State Office Building, Lansing 13, Mich., secretary.

United States Livestock Sanitary Association. Annual meeting. The Neil House, Columbus, Ohio, Oct. 12-14, 1949. Dr. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

New England Veterinary Medical Association. Annual meeting. Poland Spring House, Poland Spring, Maine, Oct. 18-19, 1949. A. E. Coombs, 15 Elm St., Skowhegan, Maine, president.

Iowa, Eastern Veterinary Medical Society. Annual meeting. Hotel Montrose, Cedar Rapids, Oct. 20-21, 1949. Laurance P. Scott, P. O. Box 325, Waterloo, Iowa, secretary.

Florida State Veterinary Medical Association. Annual meeting. Hotel George Washington, Jacksonville, Fla., Oct. 23-25. 1949. V. L. Bruns, Box 623, Williston, Fla., secretary.

American Public Health Association. Annual meeting. Hotels Statler and New Yorker, New York City, Oct. 24-28, 1949. Dr. Reginald Atwater, American Public Health Association, 1790 Broadway, New York, N. Y., executive secretary.

Mississippi Valley Veterinary Medical Association. Annual fall meeting. Pere Marquette Hotel, Peoria, Ill., Nov. 2-3, 1949. R. J. Kirkpatrick, 1235 N. Henderson St., Galesburg, Ill., secretary.

Southern Veterinary Medical Association. Annual meeting. Thomas Jefferson Hotel, Birmingham, Ala., Nov. 7-9, 1949. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Cornhusker Hotel, Lincoln, Neb., Dec. 7-9, 1949. L. V. Skidmore, College of Agriculture, Lincoln 1, Neb., secretary.

Ohio State Veterinary Medical Association. Annual meeting. The Deshler-Wallick Hotel, Columbus, Jan. 4-6, 1950. F. J. Kingma, 121 E. Weber Rd., Columbus 2, Ohio.

(*Continued on page* 28)

"VACCINATE AT 8 WEEKS OR THEREAFTER" ...WITH DISTEMPEROID VACCINE

The healthy 8-week old puppy is your ideal patient for vaccination. Immunization is established before the age of greatest susceptibility. This means economy.

Eight week old puppies need only a single 25 mg. dose of Distemperoid (Ferret Origin, Green Method) to provide solid, lasting immunity. With large breeds weighing more than 25 pounds, dosage should be 50 or more mg.

Always encourage early vaccination. Your dog owner clients benefit by obtaining immunity when it is most needed. They will also appreciate your suggestion of economy.

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Write for Descriptive Price Sheet of a Hundred Dispensing Products

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(Continued from page 26)

Oklahoma Veterinary Medical Association. Annual meeting. Jan. 9-10, 1950. Lewis H. Moe, 408 Life Sciences Bldg., Oklahoma A. & M. College, Stillwater, Okla., secretary.

Indiana Veterinary Medical Association. Annual meeting. Severin Hotel, Indianapolis, Ind., Jan. 12-14, 1950. W. W. Garverick, Zionsville, Ind., secretary.

Tri-State (Arkansas, Mississippi, Tennessee) Veterinary Conference. Peabody Hotel, Memphis, Tenn., Jan. 16-17, 1950. H. W. Nance, Lawrenceburg, Tenn., secretary.

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Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George E. Martin, 530 Stockton Ave., San José, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Wednesday of even-numbered months. R. A. Case, 400 S. Garden St., Peoria, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, the third Tuesday of each month. J. J. Arnold, Box 144, New Castle, Ind.

Jefferson County Veterinary Society, Louisville, Ky., the first Wednesday evening of each month. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

Michiana Veterinary Medical Association. Hotel Elkhart, Elkhart, Ind., 7:00 p.m., the second Thursday of each month. R. W. Worley, 3224 Lincoln Way West, South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

(Continued on page 30)

It's NEW! It's all you need for any breed!

It's Borden's DOG FOOD

• Here's a dog food made to order for dog owners who want something *extra!*

. . . not only extra goodness,
. . . extra tastiness,
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. . . but also extra assurance that they're giving their dogs the best!

And here's why Borden's Dog Food will be the choice of most owners who want that extra *something!*

Borden's wide experience and continuous research in the field of human foods, special foods for infants and invalids, vitamin concentrates, and special proteins simply mean that Borden has one of the finest nutrition research organizations in both the human and animal food industry.

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25 gram—Box of 25	$2.20
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1 lb. can (12 to case)	70c per lb.
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4 lb. bag	84c per lb.
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Sulfanilamide Powder U.S.P.

1 lb. bottle	$1.80 per lb.
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(*Continued from page 28*)

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. I. N. Bohlender, Box 588, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the second Tuesday of every other month. Charles D. Stafford, Novato, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the third Tuesday of each month. Mitchell Smith, 3740 Rosecrans Boulevard, San Diego, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. D. H. McDole, 8674 Melrose Ave., Los Angeles 46, secretary.

• • •

Foreign Congresses

Fourteenth International Veterinary Congress. London, England, Aug. 8-13, 1949.
General Secretary, Permanent Committee: Prof. L. de Blieck, Kwartellaan 51, The Hague, Netherlands.
General Secretary, Organizing Committee: Mr. W. G. R. Oates, 9 Red Lion Square, London, W. C. 1, England.
Secretary, United States Committee: J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill. (Applications for membership from veterinarians in the United States may be obtained by writing to Dr. Hardenbergh.)

National Veterinary Medical Association of Great Britain and Ireland. London, England, Aug. 12-15, 1949. F. Knight, General secretary, 36, Gordon Square, London, W.C.1.

Allergists caution against "playing favorite" with a particular antihistaminic drug. One that works wonders in some patients may fail in others—so the advice is to keep several kinds on hand.

The number of cows and of people in the U.S.A. are going in opposite directions: cows decreasing and people increasing, according to the current census.

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*(Caused by Strep. agalactiae)

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This new strength is now offered to meet the recommendation of some authorities for a minimum dosage of 100,000 Units in each quarter. Its use ensures fully adequate treatment in all cases.

MASTICS are sold only through Veterinarians, as our advertisements in dairy breed journals plainly state. We believe the treatment of all animal diseases should remain under your trained guidance.

Don't confuse **MASTICS** with later imitations, closely resembling genuine **MASTICS** in name and appearance, but available for use without supervision. You can sell your clients **MASTICS**, the *original* penicillin bougie, at a figure well below the lowest store price—and still retain control of treatment. If your distributor cannot supply you, order direct from us. Delivery charges prepaid if check is sent with order, otherwise C.O.D. plus charges. Be sure to specify strength desired.

***MASTICS** are the original penicillin bougies. These slender, wax-like sticks of Penicillin "G," inserted in the teat canal, dissolve in the milk to medicate all parts of the teat lining, cistern and large ducts. Foil-sealed,* **MASTICS** *are dated and stored under refrigeration to ensure potency.*

NEW PRODUCT-NEW USE

MASTICS have a new and effective use, of interest to every animal practitioner—*the treatment of Abscess*, in both large and small animals. For this purpose, **MASTICS** are both effective and convenient. After incision and drainage, one or more **MASTICS** of the required strength are inserted in the abscess cavity.

MASTICS, dissolving in the serous exudate, release an effective dose of Penicillin "G"—and further surgery is seldom required. Studies on this use of **MASTICS** are now in progress, and publication of the results obtained is expected shortly.

	Packages of 25	Packages of 100
HIGH POTENCY MASTICS (100,000 Units each)	$6.50	$33.00
REGULAR STRENGTH MASTICS (25,000 Units each)	$4.75	$18.00

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● *Sold to* ***graduate veterinarians*** *only.*

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On the Immortality of Animals

The sacred writing of the Hindus (the "Vedas," 1500 to 1000 B.C.) taught that the destiny of man and animals was identical (*Webster's*). Therefore, the study of human ailments was no more vigorously pursued than that of domestic animals. That ancient doctrine was accepted by the Aryan conquerors of India and was passed on through the centuries to the Arabs, the Hebrews, the Greeks, and the Romans, but was denounced as heresy by Grecian philosophers toward the end of the B.C. era. The idea of no-soul-for-animals had a far-reaching effect. It completely separated human and veterinary medicine and left them to proceed independently of each other on account of that issue.

Yet, in 1949 A.D., while the whole world is shopping around for human subsistence, who can deny that domestic animals are not sacred—in the broad sense of the term.

Diseases of Food-Producing Animals.—One phase of animal diseases which needs greater study as a basis for reliable data is that of epizootiology. The Committee recommends that the AVMA, through its Research Council, establish a fellowship for epizootiologic studies.

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Deadline for want ads 15th of month preceding date of issue.

Names of classified advertisers using key letters cannot be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Positions

Texas 1943 graduate, single, small animal experience, desires position in Texas, New Mexico, or Arizona. Seeking opportunity to buy, lease, or form partnership. Address "Box J 5," c/o Journal of the AVMA.

Accredited 1949 graduate, married, 32 years old, seeks assistantship in mixed or small animal practice in the East, leading to purchase in about a year. Please state all particulars. Address "Box J 7," c/o Journal of the AVMA.

Veterinarian, University of Latvia graduate, 37, experienced in mixed practice, married, 2 children, wants to work as an assistant. Address "Box J 9," c/o Journal of the AVMA.

Position wanted as assistant in a mixed or small animal practice by recently graduated veterinarian. Available immediately. Address "Box J 13," c/o Journal of the AVMA.

Wanted—Practices

Graduate, experienced veterinarian wants to lease or buy active small animal or mixed practice in any state. Would prefer practice in Pennsylvania, New Jersey, Maryland, or Delaware. Give full details. Can settle suitable practice at once. Address "Box G 16," c/o Journal of the AVMA.

WANTED TO BUY — Small animal practice in eastern Pennsylvania or New Jersey. No objection to some large animal work. Living quarters and hospital preferred. Substantial down payment available. I have had ten years' experience. Address "Box J 8," c/o Journal of the AVMA.

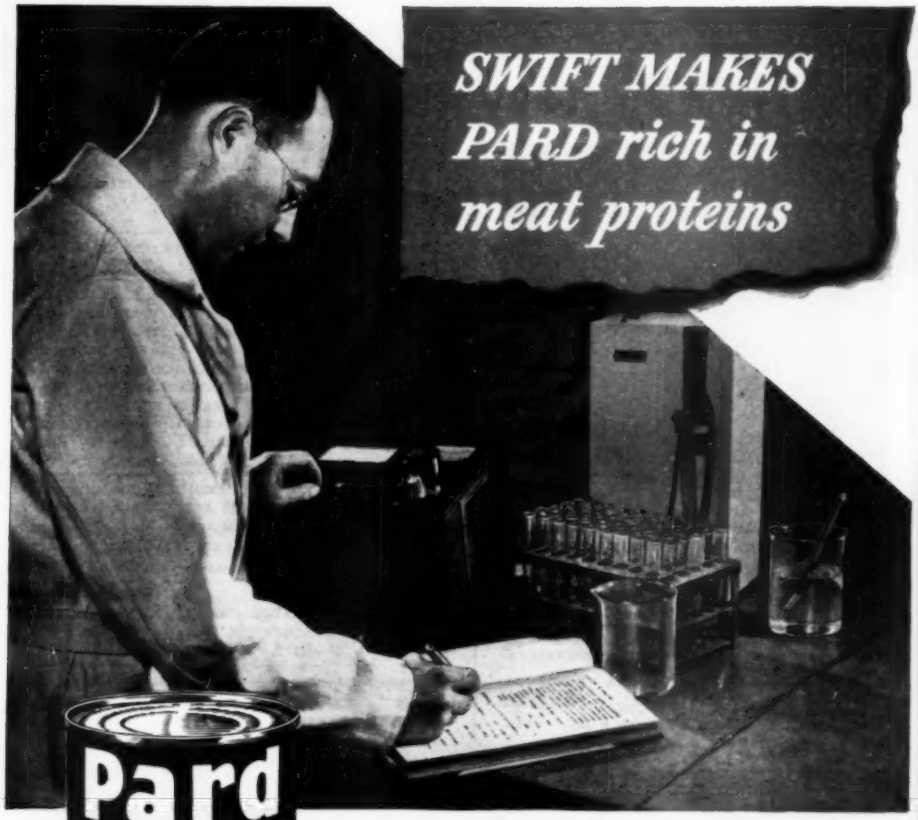
Experienced, married, graduate of recognized school wishes to purchase or lease small animal hospital in Indiana, Ohio, or near vicinity, or interested in assistantship leading to ownership. Address "Box J 6," c/o Journal of the AVMA.

Wanted—Veterinarians

Veterinary pathologist wanted for private laboratory. Excellent opportunity for experienced man in new venture of long-established firm in New York. Include complete data, including salary requirements. Address "Box J 1," c/o Journal of the AVMA.

Veterinarians wanted for permanent positions on hospital staff in New York City, working with small animals. Applicants must be able to obtain New York state license. Address "Box J 3," c/o Journal of the AVMA.

(*Continued on page 36*)



It's the "one-dish-dinner"—complete nutrition in perfect balance. The scientist in this photograph taken in Swift's laboratories is making vitamin assays of Pard. This is one of the scientific checks in the making of Pard dog food that helps assure a balanced, nutritionally excellent product which is uniform day in and day out.

The Pard formula is made to the exacting specifications of the Swift Research Laboratory. This fine laboratory is noted for its tradition of thoroughness, its modern technical equipment, and its more than half-a-century of food research. All of these combine to insure better health for dogs through better food.

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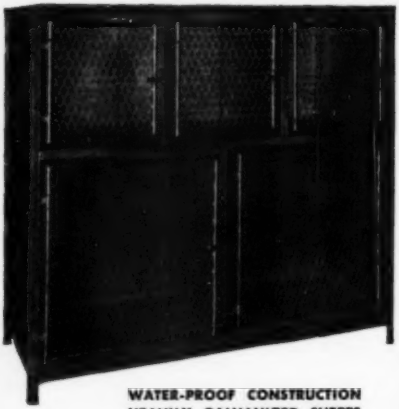

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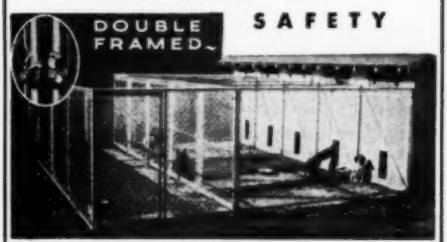

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(Continued from page 36)

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(Continued on page 38)

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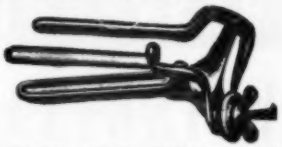

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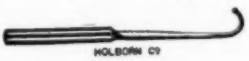

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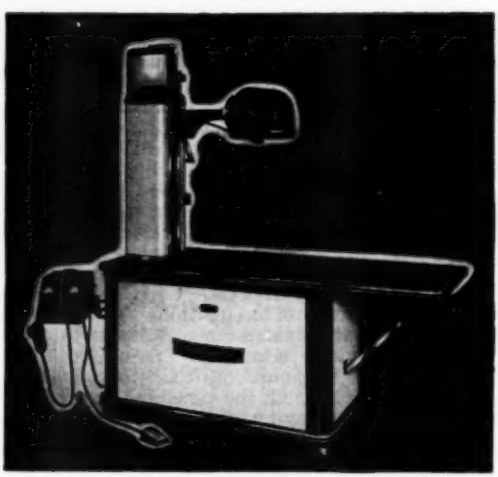

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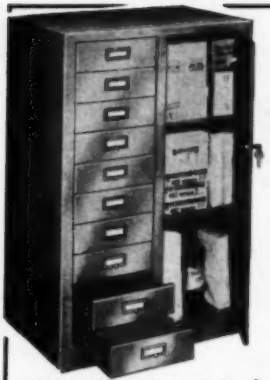

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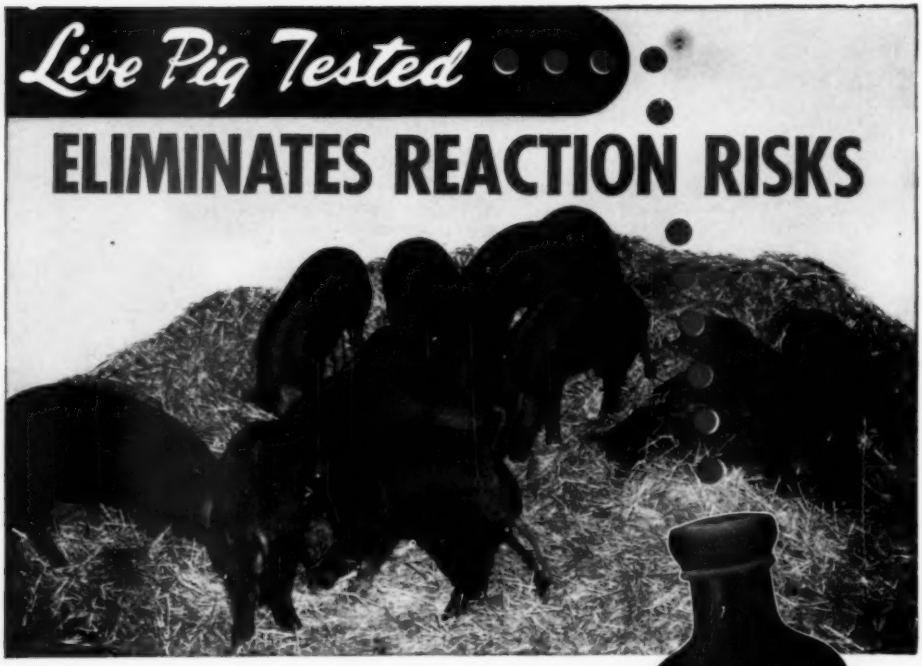

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HOG CHOLERA VACCINE

Crystal Violet Type *Tissue Origin*

Your clients appreciate Jen-Sal Hog Cholera Vaccine because it means no reaction hazards, no curtailment of feeding schedules, no risks of premises contamination with virulent virus.

There are no substitutes. Jen-Sal alone supplies Hog Cholera Vaccine of Tissue Origin that is rendered innocuous by Crystal Violet dye—an exclusive process that insures retention of maximum antigenicity.

A single 5 cc. dose of this new-process Crystal Violet Vaccine of Tissue Origin confers protection on healthy swine against field exposure for a period of approximately one year.

Vial 60 cc.
(Code: Vivac) $6.00

Vial 250 cc.
(Code: Vilet) $25.00

Patent Applied For

SOLD TO VETERINARIANS ONLY

CV-3

JENSEN-SALSBERY

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